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ORIGINAL ARTICLES

TRAUMATIC RUPTURES OF THE INTESTINES AND STOMACH; THEIR PROGNOSIS AND TREATMENT.*

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CHICAGO.

PROGNOSIS UNDER NON-OPERATIVE TREATMENT.

I recognize no such thing as non-operative treatment of traumatic rupture of hollow viscera. The term ought to be discarded. Its use in medical writings serves only to confuse the mind and create a fictitious impression that there is such an alternative method, which may give the patient a chance to live. I deny this emphatically and insist that no patient ever did recover with a ruptured gut or stomach, except those saved by the knife. At any rate, I challenge any one to produce statistics of such recoveries, and I have been unable to find any record of them.

PROGNOSIS UNDER OPERATIVE TREATMENT.

I believe that from 60 to 80 per cent. of these cases can be saved by early operation, and that the remainder die more from associated injuries than because of the bowel or stomach rupture. To sustain this belief, I report 7 cases below, operated upon in the past year, 3 with severe complications, all fatal, and 4 without complications, all recoveries. When we reflect that our diagnosis and operative technique is vastly improved in recent years, the prospect seems good for fixed low mortality in uncomplicated cases. I can see a prospect of a regular percentage of these accidents in large centers affording a diagnosis without mystery or obscurity, operated upon by improved methods, and yielding a good low mortality rate, just as intestinal obstruction or stab and bullet wounds are doing in the modern clinics.

* Read before Chicago Medical Society, Oct. 31, 1906.

It has been my fortune to operate upon a large number of wounds and injuries of the stomach and bowels. I will describe my own technic, evolved from several hundred such operations, viz., stab and bullet wounds, traumatic rupture and perforating gastric, duodenal and typhoid ulcers. The method of irrigation is the only step for which I claim originality. In all these the conditions are similar, in that the belly must be opened widely, explored and washed out, in most cases. While I employ a technic of which none of the steps are original, and one man's system may be no better than another's, it is better for each of us to have his own system in this work and rigidly follow uniformity for the sake of speed and certainty.

Systematic search of the belly for unknown trouble is a tedious and heart-breaking thing for one who blunders along without definite program. The peritoneal cavity is a vast labyrinth to the uninitiated, wherein he easily loses track of what he has done, and, by going over the same

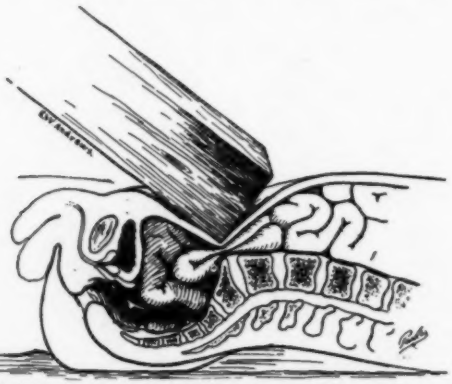

Fig. 1.—Bowel driven back upon promontory of sacrum, or "sacrovertebral angle," showing probable shearing or cutting action of this bony ridge.

ground twice, loses time and the patient's strength. The small intestines alone, lying coil upon coil, are a puzzle and a terror to one who goes blindly groping among them. Add to this the colon, stomach, bladder and solid viscera, with the true and false pelvis, and various ins and outs of the peritoneal cavity, and it is no wonder that unsystematized or careless work results in failure to find lesions and dangerous shock from prolonged exposure and handling. This is to be avoided by having a system, no matter by what precise methods, provided the operator never deviates from it.

After many errors and failures, I have excluded every unnecessary step and proceed as follows, either in stab or bullet wounds or traumatic rupture: Time of operation.—There should be no "waiting for reaction" or waiting for anything. Do not wait for certainty in diagnosis—operate on suspicion or you will be too late. An occasional belly opened without finding a ruptured viscus should not be a source of chagrin, but of relief

and satisfaction. Such an exploration does no harm. It is a life insurance. Do not wait for a leucocycte count, or, at least, not for leucocytosis. If a man has had a severe abdominal injury and you are in doubt open the belly. Even with no distention or vomiting, the bowel is probably ruptured if he has pain, rigidity and tenderness and no fracture of the ribs or pelvis. Every hour and almost every moment that goes by without relief is working deadly mischief and incurable damage.

Opening the Abdomen.—Follow the linea alba in most cases and enlarge the incision freely as soon as the first inspection shows the peri-

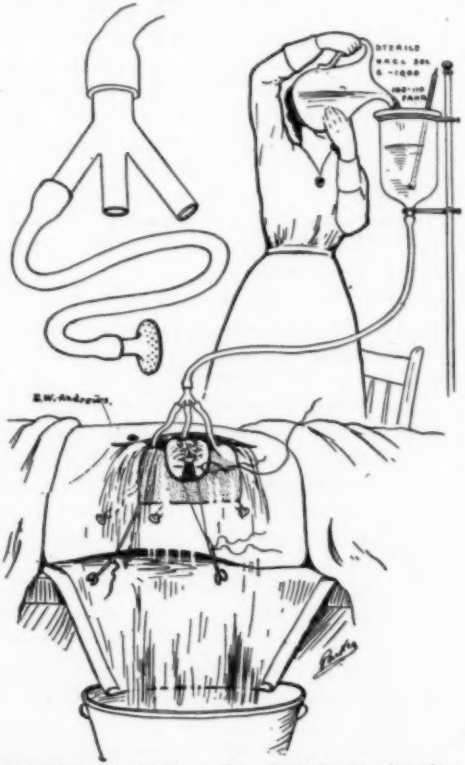

Fig. 2.—Arrangement of apparatus for simultaneous cleansing and operating. Author's triple-rose nozzles for irrigating during operation.

toneum to be soiled. Follow the direction of any tears of the abdominal muscles, as these will usually overlie the deep injury (see Case 6).

Management of Viscera.—Let the viscera bulge out to a moderate extent. The loops, not being worked over, can be covered by moist warm pads. Partial evisceration is desirable and conduces to speed. These patients do not have great gaseous distention, like cases of bowel obstruction. The loop of bowel will lie flaccid on the moist pads and can be easily replaced at the proper time.

AUTHOR'S INSTRUMENT FOR SIMULTANEOUS IRRIGATION AND OPERATION.

Unlike pus cases, these accidents usually cause extensive soiling of the peritoneum. I have been greatly impressed by three things in operating on the dirty peritoneum, where we wash out the cavity: 1, The inevitable soiling of bowel or stomach suture line by extravasated matter, a thing to be regretted, before and during the intestinal suture work; 2, the loss of time required to remove this matter if added to that required for the operation; 3, the stimulating effect of warm saline irrigation on the pulse and circulation.

We can gain all the advantage of hot saline irrigation early and shorten the laparotomy almost one-half, at the same time securing a clean field for the bowel or stomach surface and suture line, by starting our irrigation before all the other steps and continuing it to the end of the operation. For this purpose I use a triple-pointed irrigator (see Fig. 2), with three rose-pointed sinkers, which I place in the abdomen as soon as it is opened. One sinker is placed low in the pelvis; another is passed below the liver and hepatic flexure of the colon and a third near the splenic flexure. Their weight makes them self-sustaining. The bulbs are shifted alternately inside and outside the colon. During the whole operation these three tubes discharge copious streams of warm saline solution, previously sterilized, which gradually remove all traces of foreign matter from among the intestines. Blake's double-tube abdominal irrigator is also a very useful appliance (see Fig. 3). This rising stream of water floats the hollow viscera up and makes them protrude still more, but this is a help rather than an embarrassment. No one should do these operations who expects to work through small incisions or without evisceration. Partial evisceration is good. It is conservative. Its risks are less than the risk of leaving infection or overlooking lesions or of damage by deep handling. The saving of time by large incisions and extensive evisceration is tenfold more valuable than the saving of shock by not eviscerating. The thoroughness of our cleansing is vastly greater when we lift the intestines out rather freely. This does not mean that we put no limit to the handling or exposure or that one part may not be replaced before the next is drawn out. It means only that we draw out freely all such parts as are to be inspected or repaired, just as we lift the stomach, colon or jejunum outside in gastroenterostomy or the cecum outside in appendectomy.

EXPLORING FOR THE TORN LOOP.

Stand on the patient's right side, the assistant opposite, each having at hand a cambric needle threaded with fine or medium Pagenstecher linen. Now comes the really important part of what I have to say. Begin by locating the sigmoid and rectum, and incidentally the bladder wall. One can almost but not quite see to the depths of the pelvis. Use reflected light if necessary or a small glow lamp. If no soiling is found here, lift up the sigmoid and run it through both hands. Follow the colon and inspect all its parts, except the splenic and hepatic flexures, which can only be palpated. Pull up the

cecum and make a fair start up the ileum, passing it through both hands and never dropping its loops. If they are dropped once, you will instantly lose the direction of the bowel and have to begin at one end again. The assistant, standing opposite, carefully watches that side of the bowel and mesentery toward him for wounds or ecchymoses. In case, for any reason, the search begins midway of the bowel, give a loop of it to the assistant to hold carefully. Then follow its whole length in one direction,

Fig. 3.—Dr. Jos. Blake's irrigator.

repeating the search from the point held in the other. When the upper end is reached, the stomach can be inspected by drawing down the colon, and the lesser peritoneum may be opened if there is suspicion of rupture of the posterior or upper wall of the stomach.

When, at last, the torn viscus is found, further leakage is stopped by light clamps or the fingers, and the lesion repaired. Many times, when no leakage was going on, we have omitted using clamps and extra pads, but

have quickly lifted the bowel on the fingers, stitched the rent and dropped it back.

The closure of the rent, if large, should be by Connell's admirable stitch. If small, as in punctured wounds, I run it up rapidly with a continuous suture, not caring whether it be a Lembert or Czerny, and then, with the same thread, run back, burying the first row. In this way the work is rapid and perfectly safe. In multiple perforations, the assistant and surgeon should each have threaded needles and work simultaneously. I repaired, in one case, thirteen holes in the intestine and two in the bladder, all made by one bullet, and had a good recovery. The peritoneal cavity will now be clean. As much as possible of the fluid should be left inclosed. Drainage should be dispensed with when we dare to do so, which is not always.

Should there be much local peritonitis, I never wipe or peel away the membranous exudative deposits in the hope of removing infectious matter. This membranous exudate may have protective properties and may be useful. The violently inflamed surfaces which it covers may absorb all the more rapidly when denuded. Our favorable cases are those operated upon before this stage of exudate. At any rate, peritonitis in that stage, if general, is hopeless, and, if only local, can better be tamponnaded with gauze and left alone. Case 5, below, was closed without drainage and had the easiest recovery in the series.

Report of Cases.—The following six cases, five of which have been previously reported, were operated upon by me in the past year:

Case 1.—M. H., patient of Dr. Whitfield, injured by a piece of iron pipe falling upon his abdomen. A pre-existing inguinal hernia immediately became enlarged in size and irreducible. An operation was performed by some surgeon for strangulated hernia. The contents were replaced and the abdomen not opened above. The following day the patient vomited repeatedly, had agonizing abdominal pains, exquisite tenderness and distention. On the third day he was brought to Mercy Hospital, with signs of severe general peritonitis. Laparotomy disclosed the entire abdomen filled with feces and serum; a complete transverse rupture of the ileum about two meters above the cecum. The mesentery was torn and the ends of the bowel widely separated. Circular enterorrhapy was done with Connell suture, and prolonged irrigation of the abdomen caused some favorable reaction. Symptoms of peritonitis continued, and the patient died on the fifth day, greatly distended, and with severe generalized septic peritonitis.

Case 2.—In the County Hospital. R. T., aged 24, fell some distance, striking on the abdomen. One hour after the injury he was almost pulseless; pallid; had vomited; had severe abdominal pain; rigidity of recti and exquisite sensitiveness. Patient was anesthetized and prepared for exploratory laparotomy. After five minutes' anesthesia, he suddenly choked and died, some vomitus having entered the trachea. No incision was made. Patient had all the symptoms of traumatic rupture of intes-

tine, accompanied by hemorrhage. The latter was probably an important element, together with the surgical shock, in causing his sudden death. No autopsy.

Case 3.—County Hospital. F. L., aged 24, had previously had a small right inguinal hernia which protruded at times. At noon, on the day of his admission, he was struck on the abdomen by a heavy plank. Severe shock and unconsciousness lasted fifteen minutes. Drank large amounts of water and vomited profusely each time. Had pain in the abdomen, great tenderness and muscular rigidity; also large irreducible hernia of right inguinal region and small left inguinal hernia; marked dulness in lower abdomen, shifting with change of position. No blood in urine. Laparotomy showed yellow fluid in peritoneum; irrigation of deep tubes went on while search for lesion was in progress. Before this was finished, the salt solution came out clear. Transverse rupture of the ileum about one and a half meters above the valve was found. Closure, practically a circular enterorrhaphy, was done by the Connell stitch. The two hernias were found to have nothing to do with the abdominal symptoms. They were reduced by pulling from within. Abdomen closed with multiple gauze drains. Patient took the anesthetic badly and had to be stimulated. Continuous salt solution enemas for forty-eight hours. He thenceforth made an uninterrupted recovery, the stitches being removed on the thirteenth day.

Case 4.—County Hospital. C. W., aged 35, fell with an elevator containing three men, all of whom were badly injured. Struck on his abdomen over a piece of timber; had violent pain and vomiting. Abdomen very rigid, especially in lower quadrant. Lay on his left side with thighs flexed. Flanks resonant. Laparotomy five hours after injury. Beginning with the bladder and rectum, systematic search upward along the intestinal canal discovered a complete transverse tear of the jejunum about one-half meter from the duodeno-jejunal fold; the belly was extensively soiled with feces. Rent repaired with Czerny-Lembert suture. Continuous, prolonged flushing of abdomen with salt solution. Closure with tube and gauze drainage. Patient took anesthetic well and recovered rapidly from the anesthetic and operation. Stitches removed on the eleventh day, followed by good recovery.

Case 5.—County Hospital. W. G., aged 42, fell from scaffolding three stories to the ground. On entrance there was no abdominal symptom, but twenty minutes after entrance, pain began in abdomen and gradually increased. Three hours after injury abdomen very rigid; extreme pain and nausea, but no vomiting. Catheterized urine; no blood. Median incision above umbilicus. Peritoneal cavity contained large amount of slightly colored fluid, with a few flakes of mucus. Mesentery showed numerous patches of irregular-shaped ecchymosis. Occasional similar spots on wall of bowel. After examining the bladder and rectum, all parts of the intestine were passed in review, and a single transverse opening about the size of the index finger was found about one meter from the pylorus. Mushy intestinal contents were escaping from it, a considerable amount of which was already in the peritoneal cavity. In-

testinal wound closed by Connell suture. During the operation many liters of normal salt solution flowed continuously over the field. Abdomen closed without drainage, enclosing as much of the salt solution as would stay in while suturing the laparotomy wound. Subsequent course uneventful. Recovery without signs of septic peritonitis.

Case 6.—F. P., aged 34, entered Mercy Hospital, having been caught between the bumpers in switching freight cars, producing a severe contusion of abdomen on right side, extending around to lumbar region. Had signs of collapse and internal hemorrhage; large ecchymosis over injured part of abdominal wall, but no laceration of the skin. Was somewhat in collapse, had exquisitely tender abdomen, marked rigidity of the abdominal muscles and profuse vomiting. Vomitus and urine free from blood. Laparotomy six hours after injury, with median incision, showed directly, upon dividing the skin, a transverse complete rupture of the right rectus muscle, slightly above the level of umbilicus. The skin was then divided over this transverse tear and the peritoneum below it, thus opening the abdomen with a T-shaped cut. Following the lateral branch of the incision toward the right, it led directly toward the upper part of the mesocecum. The cecum was transversely ruptured, both intraperitoneally and extraperitoneally, about half its circumference and through its mesocecum. Considerable fecal matter was extravasated in the belly cavity, and a large amount of hemorrhage had taken place both into the muscle and lumbar tissues and into the free peritoneal cavity. The hemostasis involved ligature of large mesenteric branches as well as muscular branches in the abdominal wall, and the previous loss of blood was considerable. The rent in the colon was repaired by the Connell stitch. Systematic search of the abdomen showed that there was no injury of small intestines, stomach, bladder or the kidney. Muscle sutured and abdomen closed with multiple gauze drainage. Patient showed profound shock before, during and after the operation. He was stimulated by saline injections, digitalis, strychnia and camphor. His condition was somewhat improved the following day. Upon the third day he died without signs of general peritonitis, apparently more from shock and the previous hemorrhage than from peritoneal infection.

Case 7.—Operated upon by my brother, Dr. Frank Andrews, for Dr. Stubblefield, of El Paso, Ill., farmer, aged 18. Immediately after eating, was kicked in the epigastric region by a horse. Reaching El Paso, Dr. Andrews operated in a farm house about six hours after the injury. The patient was found in collapse; abdomen exquisitely tender; pulse rapid and weak; much straining and nausea, but slight vomiting. No blood in the vomitus. Abdomen somewhat distended. Laparotomy disclosed four wounds of small intestine, probably the jejunum. Three of these were about 1 cm. long; the other about 3 cm. These wounds were repaired by running Czerny-Lembert sutures. An interesting feature of this case was that the patient, having eaten a breakfast of spinach, a large amount of this grass-green, undigested material had escaped from the rents in the bowel and lay among the loops of intestines. This material was washed out. The abdomen was closed without drainage, and the patient made an uninterrupted recovery.

THE TREATMENT OF DIFFUSE SUPPURATIVE PERITONITIS.*

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The paper deals with the operative and postoperative treatment of diffuse peritonitis and not with the preventive treatment. The degree of peritonitis, in the cases reported, is of the type wherein the exudate extends over at least the greater part of the peritoneal cavity, accompanied with definite signs of inflammation of the peritoneum. The extent of the exudate was determined by the return flow irrigator, which method was found reliable. The series includes seventy-eight cases of diffuse peritonitis due to appendicitis, contributed by Drs. L. W. Hotchkiss, C. H. Beck, W. Martin and the author; thirteen caused by the perforation of gastric and duodenal ulcers and traumatic perforations of the intestines, all with extravasation of gastric or intestinal contents, contributed by Dr. Peck and the author, and eight cases of typhoid perforation operated upon by the author. The series includes all the cases of diffuse peritonitis occurring in their services since the treatment to be described was begun. All cases, no matter how severe, were given the benefit of operation.

The principles underlying the operative treatment are, first, to remove, as rapidly as possible, through a small incision, the cause of the inflammation; second, to wash or irrigate the peritoneal cavity, and, third, to use as little drainage as possible, and not to attempt to drain the peritoneal cavity. The postoperative treatment consists in placing the patient in bed in a semi-reclining position, the administration of large quantities of saline solution by rectum, either by intermittent irrigation with two tubes or by continuous proctoclysis; the washing out of the stomach and the absence of food until peristalsis has been established; the administration of morphin immediately after operation, but not after the first twenty-four hours; catharsis not employed until peristalsis has been established.

Washing of the peritoneal cavity is done by the double-current irrigator, which has been described by the author in the *Journal of Surgery, Gynecology and Obstetrics,* May, 1906. By it, irrigating is done rapidly, requiring from three to five minutes. The advantage of irrigating is that extravasated intestinal contents and inflammatory exudates are removed more quickly than can be done by drainage. Irrigating with hypotonic saline solution also prevents the absorption of toxins, not only by the removal of the toxins, but by instituting osmosis, by which the water of the irrigating fluids is absorbed into the vessels and the circulation of the patient, while the toxic substances in solution are left behind. Irrigation can be considered as a rapid form of drainage and not attended by its dangers. Deep drains, leading to the peritoneal fossæ are only used when some material has been left behind after washing, which would tend to prolong the inflammation, such as fibrinous exudates and blood. In all

* Abstract of a paper read before the Chicago Medical Society, Nov. 21, 1906.

the cases the abdominal wound was drained, the drain passing just into the peritoneal cavity. This was found to prevent suppuration in the wound.

In regard to the results in ninety-nine cases, there were four in which secondary abscesses formed, two of which were drained, two were not drained. Of the seventy-eight cases caused by appendicitis, fifteen died, a mortality of 19.2 per cent., of which seven were not drained and eight were drained. Two of these cases died of complications, the peritonitis having resolved; two were moribund and died shortly after operation; the others died of sepsis and the continuation of the peritonitis. Of the thirteen cases caused by perforation and ruptures of the stomach and upper intestinal tract, four died, a mortality of 30.7 per cent. One of these died of ileus, due to adhesions, on the twenty-sixth day after operation; the other three deaths occurred in patients operated on thirty-six hours after perforation. Of the eight cases caused by perforation of typhoid ulcers, four died, a mortality of 50 per cent. In the stomach series, of the cases that recovered, four were drained to the line of suture in the stomach, one to the pelvis, and four were not drained. Of the cases that died, two were drained and two were not drained. In the typhoid series, of those that recovered, two were drained and two were not drained. Of those that died, all were drained.

In conclusion, it may be said that the improvement in the results in the treatment of diffuse peritonitis seems to be due, mainly, to the rapidity of the operation, with consequently less injury to the periosteum and shock to the patient; to the use of large quantities of fluids for the elimination of toxins; to giving rest to the intestinal tract, and possibly to the Fowler position.

In regard to washing of the peritoneum versus draining, it is still an open question, but definite rules can not be laid down as to the treatment of all cases of peritonitis, some requiring irrigation and some not, while, on the other hand, some need draining and others do better without drainage.

DUTIES AND OBLIGATIONS RELATING TO TUBERCULOSIS.

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This paper is presented with a view to emphasizing certain facts in connection with this subject and with a firm conviction that if the importance of the "duties and obligations" could be fully realized by the several parties concerned, and if these obligations were faithfully and conscientiously fulfilled, we might hope that, in time, tuberculosis would become a rare disease, if not completely exterminated.

As fresh air is one of the most important agents in the preservation of health, it becomes a duty of the parent to provide children with a plentiful supply of this abundant commodity, not only in the living rooms during the day, but more especially in the sleeping rooms at night. Much education along this line will be necessary before air will be deemed

one of the essentials. Too many persons, especially among the ignorant, have a morbid fear of "night air," and are unwilling to permit any of it to reach a sleeping child until it has been thoroughly devitalized by confinement in a closed room for several hours, and too often among the poorer classes have been vitiated by the exhalations of a large family, living in one or two rooms and toasting themselves, as well as their food, by a stove which aids in the destruction of the life-giving air, which is still further depreciated by one or more coal oil lamps, and often by the fumes of tobacco, which fill the room after the children have been put to bed. This is no fancy picture, but one which prevails in thousands of homes. It is not too much to say that the want of fresh air is one cause of defective vitality; one of the predisposing causes of tuberculosis. The conclusion is obvious. Were all parents and guardians performing their full duty in this regard, fewer children would become tubercular; fewer would have their vital resistance to disease reduced to the vanishing point. It is an obligation of parents and guardians, then, not only to provide an abundance of the best air obtainable for the growing child, but also to educate him regarding its importance to health.

In the matter of food and clothing it may be presumed that parents will give their children the best they are able to provide, but the great prevalence of diseases of the digestive tract of children inevitably leads one to the conclusion that much might be done by a more careful supervision of their food. Probably of not less importance to the child is the care of it when ill with what parents are disposed to call "slight ailments," and which they often feel competent to treat either with the so-called "simple remedies," or, as more frequently happens, with some form of patent "dope." The warning to parents against this can not be too strong, especially in the catarrhal affections of the air passages, where the tendency is so great to use some form of "cough cure," and in the glandular swellings, where the "blood purifiers" are so highly recommended. Another class of cases may be mentioned, in which harm is often done by "home treatment;" those which begin by pain and swelling in joints, and which are so frequently called "growing pains," or rheumatism, in which slight injuries to the part determine the colonization of tubercle bacilli, with the resulting "white swelling."

Teachers in our public and parochial schools have important duties regarding the children under their care, beyond simply instructing them in the rudiments of education. Teachers spend several hours a day with children; they have excellent opportunity to observe their condition and the variations from day to day; whether the child is in good health or is declining; whether subject to "colds" and catarrhs; whether dull and listless or alert and bright; flushed with fever or pallid from cold. Observation of these facts implies a duty on the part of the teacher to notify the parents and to suggest investigation. A special duty of the teacher is to see to it that the child is not confined to an illy ventilated, insufficiently heated or overheated room; that all children showing signs of disease be sent home with a note explanatory of the condition; that overindulgence in violent exercises, especially "rope jumping," be avoided.

In this connection it may be as well to insist that the habit of exchanging pencils, and the use of a common drinking cup, should be positively prohibited in schools.

Employers of any form of labor are often indifferent to the welfare of those in their employ. Some are ignorant of dangers to which their help may be exposed and also ignorant of the danger to which illness in their employés may expose them; but it is manifestly a duty to provide healthful places in which their work may be carried on. All workshops, stores, factories and even the kitchens should be kept in a sanitary condition. The cities are abundantly supplied with an ignorant and disease-breeding working population, and a strict supervision is necessary in order to prevent disease in these and the consequent exposure of the employer's family to infection. This is particularly true of house servants, as a single one may infect every room in a house, thus exposing every member of a family to the disease. This is especially true of tuberculosis. A strict rule should be enforced against spitting on the floors or in or about stores, factories or shops where persons work. I have been impressed by the neglect of duty on the part of municipal officers in the enforcement of ordinances relating to the public health. The police, whose special duty it is to see that the ordinances are observed, are frequent violators of the "anti-spitting ordinance."

The most obvious neglect of duty on the part of city and county authorities is in their failure to provide for the care of the tuberculous poor. Whenever this matter is brought before these officers we are informed that the city pays taxes into the county treasury for the maintenance of the poor; and the county authorities tell us they have a place for the care of the paupers and suggest the "poor farm" as the proper place. How long will it take to educate the public to the point that they will no longer permit this? It is certainly the duty of health officers to point out the necessity of the proper care of all tuberculous poor. Physicians should second their efforts by all honorable means. The proper officers in cities, towns and counties should institute some systematic method for the cure of those now tubercular and for the prevention of the further spread of the disease.

While we believe that the laws governing the state board of health are open to criticism in several particulars, we are obliged to admit that in the protection of our citizens from invasion of the state by epidemic diseases it is quite efficient, but when we see that consumption causes the death of more persons than all other contagious and infectious diseases we feel like suggesting to our Governor that a strong effort on his part to secure the passage of suitable laws for the prevention of that disease would redound to his honor, and, if successful in securing such laws, would be of untold benefit to the state and to mankind. The legislature which will recognize the importance of this measure and pass such bills and make suitable appropriations for properly carrying out their provisions, will place the names of its members high on the roll of honor.

We see persons in every community who spend much time and money for the relief of the sick and needy. This is to be commended. But

there are many who are disposed to be charitable who give freely for any object presented, without inquiry as to the merits of the case, and too often the so-called "charity" does more harm than good. In order that the best results be obtained from contributions of this kind, some system should be established in each community. Mr. W. H. McClain, general manager of the St. Louis Provident Association, says that much of the money given for charitable purposes is "money worse than thrown away." We may not take so strong a position regarding the money or other aid given the consumptive, but we may say without fear of contradiction that the same amount, judiciously used to prevent the disease, would often do far more good. A few days of rest for the overworked woman, with good food and freedom from worry, may save her own life and enable her to care for her children; may abort a disease which would cause a year of suffering and end in death. If the charitable persons in each community would get together and take steps to find the cases of incipient tuberculosis among the poor, and would provide the means for their subsistence until they were able to care for themselves, they would be doing far more good than they can possibly do by aiding only the advanced cases, as is usually done.

The wealthy citizen, who wishes to do something to perpetuate his name, would find this a particularly inviting field. It is probable that in every community there is some one who will be willing to aid in the establishment of sanatoria for the care of the tubercular if the matter is presented in the right way. The world is full of good people who are ready to give of their abundance for any worthy object; the neglect of this form of benevolence in the past is due to the newness of the present aspect of the subject. When there has been a more general education along this line, there will develop an irresistible sentiment in favor of the prevention of the disease by the proper care of those affected. We may hope some time to see cities, towns, counties and villages supplied with suitable places for the care of the tubercular. Let us so educate the public that the most popular form of endowment will be the endowment of sanatoria, so that to die rich will be a stigma so long as there are sick poor to be cared for.

We have now considered several classes of persons whose duties and obligations are based only on moral or humane grounds; we will here refer to some whose obligations are, or should be, made legal and should be rigidly enforced. In most cities the laws and ordinances require street car companies to keep their cars in a sanitary condition, a requirement apparently more often honored in the breach than in the observance in many places. Dust and dirt are permitted to accumulate under the seats and on the ledges and moldings; spitting is permitted on almost every car line in the country, though ordinances against this form of defilement are now very common. In some cities, conductors are instructed to inform passengers who are seen to spit on the floor of the penalty for violating the "anti-spitting" ordinance, and, if he still persist in his pernicious practice, to cause his arrest. Observation shows that few conductors ever pay any attention to this important duty. In winter in many places the street cars

are insufficiently heated, favoring the invasion of disease, especially catarrhal affections, the forerunners of pulmonary tuberculosis. There have been many cases of lung disease attributed to a "cold" acquired while riding in a cold car.

The steam railways are even worse than the street cars, for the reason that longer trips are usually made in them; their furnishings are usually more subject to infection; and, being occupied for a longer time by diseased persons, the chances for infection are much greater. Sleeping cars, with their closed berths and heavy draperies, require the strictest sanitary inspection. Thorough fumigation and disinfection should be required at the end of every run; by this means persons boarding a train at any terminus or at any point on the line would be assured that no infection need be feared from former occupants. Under present conditions, with so many tubercular persons traveling, some of whom, because they are tubercular, engaged in pursuits requiring travel; others, seeking new locations for the benefit of their health and spending considerable time in the cars and thus infecting berths and cushions, the wonder is, not that so many persons acquire the disease, but that so many escape infection.

Proprietors and managers of hotels and boarding houses should be impressed with a sense of their obligation to protect their guests from the danger of infection. As in the case of the railroads, hotels entertain numbers of persons who are afflicted with various diseases, tuberculosis being the most common of all; and it is not saying to much to assert that one careless tubercular person may deposit enough tubercle bacilli in a room in one night to infect all succeeding guests for months to come. The obvious duty of the proprietor is to see that his rooms, bedding, couches, walls, window ledges, draperies, carpets, rugs and furniture shall be in a sanitary condition upon the entrance of each guest. Chambermaids and scrubwomen are particularly liable to contract tuberculosis, and many cases among these persons may be traced to exposures in the line of their duties in cleaning rooms occupied by those afflicted with that disease. Again, many of these women have the disease and, being ignorant of its dangerous character or careless as to where they expectorate, may themselves infect the rooms they are supposed to clean. The process of cleaning furniture with a dry cloth or with a brush can not be too severely condemned. The cheaper hotels and the poorer class of boarding houses are most to be feared, and are the places which should be most strictly inspected. In these cheap lodging and boarding places many persons are lodged in unventilated rooms; often to the number of six, eight or ten; the atmosphere reeking with the exhalations from unwashed bodies, still further polluted by the fumes of beer and whisky, and the whole saturated with tobacco smoke. The sick and the well constantly suffer from the effects of the vitiated air; and, if one is tubercular, the probabilities are in favor of the infection of others. In the cities there are many places such as are here described; the results, while often remote, can scarcely be said to be the less certain.

Of individual responsibility, it can always be said that while companies and corporations may evade their plain duty because of a divided

responsibility, yet each member of a company or corporation or of a community has such plain personal "duties and obligations" that, if each performs his part in the service of hygeia, there will be nothing of importance left undone.

It is manifestly the duty of every person to avoid every possible means of communicating infections to others. It is also a duty falling upon those who are better informed in regard to such matters to use their best efforts to instruct the uninformed, so that no one may plead ignorance as an excuse for violating rules of common decency. The spitting habit, so firmly fixed upon the American that a recent traveler from Europe alluded to it as an American trait, should be abandoned. This result may be accomplished only by persistently keeping it before the people; by educating the young in the ethics of life; by passing laws and ordinances prohibiting spitting; by early and careful instruction in the highest type of personal hygiene. This early instruction must be begun in the home and continued in the schools, so that no child will be ignorant of the evils of the habit nor indifferent to the consequences. A distinguished St. Louis physician said recently that "spitting should be absolutely prohibited in the streets as well as on the sidewalks"; and while this would, if such stringent laws could be enforced, certainly greatly lessen the deposit of bacilli in places where they could be taken up by air currents and deposited in the air tubes of others, yet it is too much to expect; the enforcement of the ordinances against spitting in street cars, on the floors of public halls and on the sidewalks and in other public places is sufficiently difficult, and, indeed, is impossible with the present police system in any city in the country. The only sure way is to so educate the people that each one will be mindful of his own duty to his fellows and conscious of the indecency of the foul habit of spitting.

I trust that in calling the attention of physicians to their obligations I am not doing more than my own duty. It is not too much to say that more is expected of the doctor and in the final accounting more will be required of him because of his superior knowledge. It is also true that many doctors are so engrossed with money-making schemes, with fads and specialties in medicine, with fast horses, with automobiles, with women, wine and other dissipations, that patients have but slight consideration; that efforts directed toward the general betterment of mankind have but a small share of their attention. I am pleased to add, however, that the large majority of doctors are well disposed toward any measures intended for the amelioration of human suffering, of which the prevention of disease, especially of tuberculosis, is the most important. It is to this large class of earnest, conscientious and honorable physicians that I appeal for aid in the diffusion of knowledge relating to tuberculosis. They can do this by assisting in the organization of societies for the prevention of tuberculosis in their respective communities; by instructing those with whom they come in contact as to the character of this very general and fatal malady; of its curability; of its communicability and of means by which it may be prevented.

I deem it particularly incumbent on the members of the state and county societies to use their influence, individually and collectively, for the improvement of the condition of the tubercular poor; to urge the passage of laws by the state legislatures providing for the care of this class of unfortunates; to aid in the election to the legislature of those who will aid in this work; and, in the counties, to work for the election of such supervisors as will be willing to do all in their power to provide for the care of the poor in their respective territories.

I consider it one of the highest duties of the physician to instruct his clientele in the rudiments of the prevention of disease, and especially of tuberculosis; to warn parents against a needless dosing of their children; against the harmful results of neglect in acute colds; against every form of faulty hygiene. Above all the obligations of the doctor is his duty to his patient to make a sure and early diagnosis in tubercular disease. The failure to make this early diagnosis has stood in the way of the recovery of many thousands of persons; it has been responsible for many more thousands of exposures to the infection and for additional cases innumerable.

In a paper entitled "A Plea for the Victim of Tuberculosis" I have briefly indicated how we may perform some of our duties as physicians as follows: "Collectively, we may prepare for publication in the lay press circulars giving information regarding tuberculosis; its absolute incurability with any known drug; the great danger of relying upon the lying statements of manufacturers of so-called cures for consumption; the necessity for fresh air and good food for those already diseased; the communicability of the disease and the manner of its limitation; the fallacy regarding heredity; the futility of a change of climate as a curative measure; the curability of tuberculosis in the home climate and in the home, and the means by which this may be effected; the adoption of resolutions and their proper presentation to legislative bodies, both municipal and state, urging the needs of this large and ever-present class of unfortunates who have fallen victims because of ignorance or wilful neglect of measures which might have prevented the disease. As individuals, we can aid in the distribution of literature; we can instruct our patients and friends in the dangers of neglect of minor ailments, and show them that we are not selfish in it, as is sometimes charged; we can protest against an indulgence in nostrums of all kinds, and especially those which, by their very action in allaying the cough, show them to contain sedatives which mask the real disease, and which, by their delusive and pleasing effects, may delay the examination into their condition until disease has made such inroads that recovery is impossible, or is, at least, rendered doubtful. In dealing with the evils of medicine taking, we will, at all times, be suspected of being mercenary; of advising against the use of these remedies because we wish the patient to come to us; but this we need not fear; we should rather fear the giving of our tacit sanction to the use of a remedy which might endanger the life of our patients by holding out the delusive phantom of hope in even one single case which might have been saved by early diagnosis. This we may do as individ-

uals to aid in the prevention of the disease. But this is not the limit of our duty. There is another duty we owe to our clientele, one whicl. will have a most important bearing on the subject, and which is still our duty, if we disregard all other obligations which have been mentioned. This is our obligation to make an early diagnosis in every case of tubercular disease. This duty we can in no wise avoid. Its importance is twofold. First, it is of the highest importance to the individual in whom the discovery of tuberculosis is made, for the reason that only in early diagnosis is there hope of a cure. Second, the early diagnosis assures attention to such details as will prevent infection of others, since an early diagnosis means that no tissue destruction has resulted, hence there has been no expectoration of bacilli, by which the disease may be conveyed to unsuspecting victims."

In conclusion, I may say that every intelligent human being has duties and obligations relating to the prevalence of this disease; that for the proper education of all classes it is necessary that the doctor and the teacher should be ever vigilant in their efforts in the prevention of this disease; that indifference on the part of the doctor is one of the chief obstacles to the establishment of suitable sanitaria, free tuberculosis dispensaries, tent colonies, the organization of societies for the prevention of the disease, and other measures, municipal, county and state, so imperatively necessary for the good of mankind.

DISCUSSION.

Dr. J. W. Pettit, Ottawa:—There certainly can be no exceptions taken to anything the essayist has said. The great trouble, however, in dealing with the question of treatment is that we do not sufficiently recognize the importance of careful attention to details. The profession is agreed as to general principles, but we find ourselves in a very chaotic condition when it comes to the question of how to apply these general principles. The great trouble is that both the profession and the laity regard the treatment as both simple and easy. It is neither.

We also fail to recognize the limitations of treatment. Many have jumped to the conclusion that because tuberculosis is curable that it is curable in all stages. This is only true in a very limited sense. Advanced, and even far advanced, cases may be cured, but these are the exceptions. The rule is that they can not. It is only the incipient cases that can be cured with any reasonable degree of certainty. Few propositions in medicine are more inviting than the treatment of an incipient case of tuberculosis. Few more discouraging and disappointing when the disease is well advanced.

Both the profession and the laity also make a mistake in estimating a cure. Patients who do well will usually get rid of the mixed infection within thirty to sixty days. During this time there is very marked improvement, with an abatement of all the active symptoms. Patients look well, feel well and usually think they are well. It is difficult for the physician, who knows the patient is not cured, but simply on the road to recovery, to make him and his friends believe that the condition described is not a cure. The characteristic optimism of the tuberculous patient, if not properly regulated, lures him to his destruction.

Another practical fact which militates against the treatment is that it is made unnecessarily expensive, especially in the leading institutions of the country.

The element of time necessary to effect a cure in the average case is also ignored by the patients and friends. Public expectation as to the benefits of the modern treatment of tuberculosis will not be realized until we have learned to confine our efforts more largely to incipient cases and firmly impress the patients in the advanced stages of the disease that they must not expect a cure

unless they can and will follow out the rigid rules of sanatorium treatment for a number of months.

Dr. Clarence L. Wheaton, Chicago:—It seems very fitting that the opening paper on this program should deal with tuberculosis. This disease presents more complex economic problems than any other, and it is producing more suffering than any other disease, with the exception of insanity. Dr. Lillie has covered the subject very thoroughly in his paper, and I can add but very little.

The tuberculosis problem as it is presented to us, especially in the larger cities, is essentially one of education. We must educate the masses. With that end in view, the Chicago Tuberculosis Institute has been established, and they intend to construct free dispensaries in the crowded districts of Chicago, to open a day camp, to which children, especially, can be sent, an information bureau to which people can go at any time for advice and information on the subject of tuberculosis and its treatment. It is also intended to open an experimental station for investigation and the production of certain curative preparations.

This method of campaigning against tuberculosis will reach the masses, especially the poor, but we must remember that we have thousands of homeless to deal with, and for these, I believe, the sanatorium is the ideal institution. However, we can not hope, through the medium of the private sanatorium, to achieve the most far-reaching results in the solving of the tuberculosis problem. We will find these institutions, like many other private sanatoria, excluding the indigent patients, accepting no hopeless cases, refusing to care for those who will become a burden to their friends and a charge upon state or county, without adequate facilities for their care. In the Cook County Hospital for Consumptives, 80 per cent. of the patients die, I am told.

The best sanatorium is the one that is under the control of the state, where the individual can be educated in the importance of hygiene, going forth as a missionary in the way of right living. The destitute may go there and receive proper treatment. The danger of infection to others may be eliminated very largely, and proper care and attention to detail may restore those patients not hopelessly diseased to lives of usefulness and activity. Let us remember that the prolongation of life by the suppression of preventable diseases is of greater value to the state than the cost of the means employed.

Dr. Ethan Allen Gray, Chicago: Prevention has always been considered more valuable than cure, and in no disease more so than in tuberculosis. In case a life is lost as the result of an accident, the state allows $5,000 for that life. Figure each life lost through tuberculosis at that price and see what it amounts to annually. Say that the average length of life of the tuberculous individual is three years. Suppose he can work one year. That leaves him a charge for two years either of the state or his friends, and supposing he is able, on an average, to earn $500 a year. That will give a total loss of $1,000 for each case of tuberculosis. This does not take into consideration the physician's remuneration, nursing or any other expense or outlay. Apply these figures to the city of Chicago, where last year there were over 3,600 deaths from tuberculosis alone. That will give us $36,000,000 in absolute loss to the community. The health authorities figure that our drainage canal has paid for itself and something like $10,000,000 over in the saving of human lives. I think that if the health authorities can take that view, we can take the same view with reference to tuberculosis. There is something tangible to work on. A state sanatorium or a series of sanatoria for the cure of early or incipient cases of tuberculosis will more than pay for itself in the course of time. Each sanatorium becomes an educational center. The physician ought to be an educator, but the sanatorium is a much greater educator. Dr. Pettit will bear me out when I say that every patient he sends home with his tuberculosis arrested or cured becomes a disciple of open air and proper care in the treatment of tuberculosis. That is true, even of those who are not benefited.

Dr. Pettit also spoke of the early cases. I have seen very few of them. A friend, in speaking of the matter, said, that if we do find an early case and make a diagnosis long before we find the tubercle bacillus, in the prebacillary

stage, the patient will not believe us and may go to some other physician, who will tell him that there is nothing the matter with him, and the case thus becomes a late one. We get them when they are cases of mixed infection and the patient is a consumptive, not merely a tuberculous patient, but we are expected to cure him just the same. I think that if we will explain the matter of prevention to our patients we will be doing more than we are now doing in the way of a cure of the disease.

The Chicago Tuberculosis Institution expects to protect the individual and stand between him and his family and others with whom he comes in contact. If we will do that, we will do more to cut down the death rate than we can with three times the degree of effort expended in the matter of trying to bring about a cure.

Dr. George W. Webster, Chicago:—The people of the United States recently were horrified by the terrible calamity in California where so many people were killed. As a result of this the legislatures of the various states, the Congress of the United States and Associations of every kind of a benevolent and charitable character, throughout the United States, rushed to the assistance of the people of San Francisco. This represents one of the anomalies in charitable work in this country. The number of lives lost in that earthquake does not equal by one-half the annual death rate from tuberculosis in the State of California. But the people of California or any other state in the Union are not concerned particularly about the death rate from tuberculosis; in fact, they know nothing about it. There is no reason why we should grow so excited over the loss of lives from earthquakes or fires, and be absolutely indifferent to the infinitely greater loss of life from preventable diseases.

In the matter of sanatoria treatment I want to say, as an individual and as a representative of the State Board of Health, that from the time this question was first discussed up to the present moment the board of this state has stood unalterably in favor of a state sanatorium for tuberculosis. One of the reasons for this is not alone because of the value of a sanatorium as a means of cure of tuberculosis, but because of its infinitely greater worth, as an educational institution. Every state sanatorium is, above all things, an educational institution, and it also protects the people.

One of the principles underlying this matter of prevention of diseases and state authority in regard to certain dependents is not well understood. The reason why we maintain institutions at Joliet and elsewhere in the state for the temporary lodgment of criminals is not thoroughly understood. What is the purpose of these institutions? That of reforming criminals? Not at all. Why have we so many institutions for the care of the insane? Are they primarily for the purpose of treatment? Not at all. Why do we confine smallpox patients in isolation hospitals? For the purpose of treatment? Not at all. The underlying principle of it all is that the well, the sane and the non-criminal people of the state have a constitutional, inherent right to protection. In the establishment of the state sanatorium for the treatment of consumption the people of this state have an inherent, inalienable, plenary right to the protection of life, liberty and the pursuit of happiness. The sanatorium, therefore, is not only an educational institution, but it protects the well at home.

We have been told, and quite recently, by those in authority that the expense of maintaining an institution of this kind would be too great; that the expense is unjustifiable. It is not a question of the state taking care of a certain number of its tuberculous poor in a state sanatorium, but it is entirely a question of what it will cost the state to protect its citizens from preventable diseases. It is the duty of the state to at least make an attempt to protect its people. If we spend $100,000 a year on a tuberculosis sanatorium, what does it mean? That it costs 2 cents per capita for this additional protection to 5,000,000 of people.

I was very much pleased to note that so much attention was paid to this matter of early diagnosis. It is the attitude of the State Board of Health. Some time ago I prepared a pamphlet on the early diagnosis of tuberculosis, which was sent to every physician in the state. In order that those who are not

equipped to make a laboratory diagnosis may avail themselves of this aid, the State Board of Health has established a laboratory here in Springfield, to which specimens of sputum can be sent for diagnosis at any time, free of charge.

Dr. George C. Adams, East St. Louis:—I merely wish to refer to the influence of the daily press on the public. We all know that a large majority of the people of this country receive most of their education in and knowledge of medical subjects from the newspapers. Unfortunately, our daily papers carry the advertisements of every medicine faker and quack in the country. If we could enlist the sympathies of these newspapers for the good of the public, instead of working in opposition to its welfare, it would be possible to convert nearly every home in the country into a sanatorium, when necessary, for the treatment of tuberculosis.

If such papers as Dr. Lillie's could be read in open meeting, much more good would be accomplished thereby than to read them before medical meetings only. Physicians are already familiar with all the facts, although it is a good thing to impress them on physicians every now and then. But as long as we have this army of newspapers carrying out news which is untrue regarding tuberculosis, it will be a hard fight for the profession.

Dr. George W. Webster, Chicago:—While we recognize the pernicious influence of newspaper advertising, yet we should give the devil his due. During the last year all the articles that have been prepared by the State Board of Health on these general questions touching on the prevention of tuberculosis in the State of Illinois were published by all the newspapers in the state. Thus a million and a half of copies of these articles were distributed free.

Dr. Lillie (closing the discussion):—It is very gratifying to me that my paper excited some interest. I was impelled to write it because of facts I had observed in connection with this subject. Only a few days ago, speaking of this subject with one of the physicians of my city, he asked me what the title of my paper was. When I told him he replied that he thought we were hammering away at tuberculosis too hard. I do not believe that this subject can be talked about too much. We never can say enough to educate the public properly on this subject, and the unpardonable ignorance of it I have seen among physicians is enough to appall one. There is much need for education among physicians on this subject as there is among the laity. It is astonishing how many patients have passed through the hands of two or four or more physicians without having their ailment diagnosed. It is wrong, and the fault rests only with the physicians.

I am glad that Dr. Pettit referred to the importance of early diagnosis. Early in the disease is the only time when we can expect to do our patients any good. Of course, we may accomplish something in the advanced stages, but it is preferable to get the case early. If we can disabuse the public of this one thought, that there is a cure for all forms of tuberculosis and all stages of the disease, and that it can be put on the market and sold for so much per, and that the disease is not so much amenable to drugs as it is to other methods of treatment, we will have accomplished all we can hope to do. These patients will then come to us in the incipient stages of the disease, when there is less danger to everybody.

I am glad the doctor touched on the question of sanatoria. I believe in the establishment of a public sanatorium in every county, and that some provision ought to be made in every city and hamlet for the care of the tuberculous poor. We must also learn how to treat these patients in their own homes, because some of them can not be removed to a sanatorium. These are the things that we must talk about and teach. I would like to hear an expression from the society in regard to proper legislation for the establishment of a sanatorium.

THE IMPORTANCE OF SPECIALTIES IN EDUCATIONAL CENTERS.*

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I love my profession and its advances. I do not think the lay people fully appreciate our profession and what we are doing for them. They do not fully realize the importance of surgery and what surgery does for them; how it relieves their sufferings and saves their lives. Chicago has contributed much to scientific surgery. You possessed the first great pathologist of America—Christian Fenger, and while talking about the importance of specialties in educational centers, I desire to allude pointedly to what Chicago has done for the specialties. You have given much to surgery and to science, more than other American cities of educational importance. Christian Fenger gave an impetus to pathology that has spread all over this great country. His pupils all became lovers of pathology, many of them great teachers and important operators. Most of you do not fully realize how important Christian Fenger was to the American people. Following him, Nicholas Senn, in one decade, gave a greater impetus to surgery than the rest of the world. Unconsciously, he put hundreds of young men at work. He had the youths of the country repeating his experiments and continuing his investigations and researches in stables and laboratories the land over, and, following these great men, we have a number of men in this city who are brilliant surgeons, whose work is attracting the attention of the world. They are scientific, advanced, deep surgical thinkers; they are leaders in pathology and surgery. I have come a long way to tell you that, feeling that you do not fully appreciate what these men have done and are doing, and what you, in this city, have done for pathology and surgery.

I am very fond of the specialties. I feel the importance of them in educational centers like Chicago, Baltimore, Philadelphia, etc. The educational centers should encourage specialties. We should encourage these specialists to achieve a higher degree of scientific precision and accuracy. In the educational centers, we are really unconscious of the development of specialties. The demand for specialties always exists. Professional and lay people demand special care throughout the country. They demand special knowlege. Prolonged military service favors the development of specialties and specialists. I have noticed that a retiring military officer commonly takes up a specialty. The signal code of the American army came from a physician who worked it out. The leaders in surgery, the pastmasters in surgery gave us the specialties in the educational centers. Hunter McGuire, Sir Spencer Wells, D. Hayes Agnew, Nicholas Senn, and others, have developed and built up the specialties in the large cities. Their pupils are the specialists; it matters not whether it is the eye, the ear, the nose or throat, their pupils are the specialists. Many of their pupils adorn every department of medicine. It is vitally important that a man should serve an apprenticeship in medicine before

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taking up a specialty. Agnew, an active country practitioner, later taught anatomy successfully. Hunter McGuire was one of his pupils while a student. Agnew, following the lead of Marion Sims, repaired the accidents incident to parturition, and was the first successful gynecologist that ever lived in Philadelphia, that justly celebrated medical center. Following the lead of Sims, he repaired what was then considered incurable, namely, vesico-vaginal fistula, by the use of silver wire, and later wrote a little book on the anatomy of the female perineum. Later, he abandoned gynecology and turned it over to his pupils. He encouraged them, most of them young general surgeons, to take up the specialty. Sir Spencer Wells, returning from the Crimean War as a general surgeon, took up, perfected, and re-established the operation for the removal of cystoma. The general surgeon, therefore, has had much to do with encouraging and perfecting the specialties in educational centers. Sims perfected operations for some of the loathsome afflictions that the general surgeon had failed to relieve, and, after curing four colored women in Alabama, he created the Women's Hospital in New York, that great plastic school for the repair of accidents incident to parturition, and then made his departure for Europe. He walked the streets of Paris for a case on which to demonstrate the practicability of the operation for vesico-vaginal fistula, leaving his pupil, Emmet, to perfect and devise other procedures for the relief of accidents incident to parturition. Emmet was a good practitioner.

Many physicians throughout the country have an idea that the specialist is a one-sided man. I have never felt so. I know better, because I know many specialists, and it is exceptional to find a specialist who is narrow. Of course, we have some few throughout the country of the mushroom type, who graduate and say that they are going to make a specialty of the eye, the ear, the nose or throat, and it is those men who take a post-graduate course of about two weeks or a month, mixed with good beer and cheese, and then return, thinking they are fully qualified to adopt and practice a specialty. That is all they know about specialties. Emmet controlled the maternity work of Ward's Island as a government official for four years. He was probably at that time one of the best obstetricians in the world. He attended as many as seven or ten women a day for a period of four years. At one time, he had a larger knowledge and experience with typhoid and typhus on Ward's Island than most American practitioners. So the internists must not criticize men like Emmet.

Sir Spencer Wells was a good general surgeon. McGuire and his pupils, at one time, did about all the good gynecology that was done in the South, particularly in Virginia and North Carolina. Later, he turned all of that work over to a younger school of well-trained surgeons, men who had served a good apprenticeship in surgery, and they all did scientific gynecological work. So I repeat: The good gynecologists and specialists of this country came from general surgeons.

For a long while I practiced general surgery, and much of my material came from Agnew. The splendid development of gynecology as a spe-

cialty is beautifully illustrated by comparing it with the advance of other specialties. It is really the only specialty in this country that has more than one special society.

A number of Americans have made trips, at great expenditure of time and money, for the purpose of reading papers before local, county and state societies to advance these specialties. They have made the specialists. The specialists who give up a good general practice, who give up a good obstetrical practice, to follow a specialty in an educational center should be encouraged and rewarded.

There is a tendency at present throughout this country to build more hospitals, and I predict that where we have four or more good physicians in towns of 2,000 or more inhabitants we are going to have a hospital and ought to have one. The material in these small cities, thickly settled, in manufacturing communities, is very abundant, and it is thrice important that we should have, at these points, well-trained men, disciplined men, who have served an apprenticeship in the educational centers, and who can do good surgical work. At present, much of the work done in a surgical way in these places is unfortunate. The mortality in the country from operations done by inexperienced men, men without much judgment, is great. The results are bad. There is but one way to correct it, and that is to compel these men to serve an apprenticeship in the educational centers. You have here in Chicago some of the most important and brilliant surgeons in the world; they are doing advanced, scientific work. They are doing ideal work, but they are not doing the teaching they should. They should be paid salaries and compelled to teach. The residents in hospitals should be doubled and quadrupled, and every hospital in the land should be made a school. Public charities should be used wisely and mainly for educational purposes.

Tait distributed all over the world good operators simply by giving them object lessions. He demonstrated beautifully that if he could make simple object-lessons he could make better operators by giving them an apprenticeship. I was one of his object-lesson pupils, as well as many others, and all of us, I think, have demonstrated the value of this by putting our pupils under us to work, making them serve apprenticeships and thus making them better operators than Mr. Tait made. The advanced thinkers and leaders in the profession—men like Mayo, Ochsner, Deaver and Murphy—are not apprenticing young men as they should. While they are doing the advanced thinking, teaching and operating theoretically, they are not making men to do the practical work they should do. Their influence is powerful. The impress of teachers is peculiar. Some men can put others to work theoretically, while others cannot. Gross and Pancoast, theoretically, could make surgeons; Agnew and Leidy could make surgeons; Murphy can make surgeons.

He rarely opens his mouth that he does not do something towards making surgeons, especially before state and national societies. If he did not, they would not solicit his valuable contributions and discussions. Such societies appreciate and highly value his work. It is impossible for men like Gross and Pancoast to teach surgery without making surgeons.

The same may be said of Leidy and Agnew. I am very proud indeed of what Chicago is doing for medicine and for surgery. I am very proud of what the American profession has done for surgery. About all of the advances in my specialty, gynecology and abdominal surgery have been made in America. Abdominal surgery belongs to America. The operation for ectopic pregnancy was practiced in 1799 successfully by a Virginian—Baynham. In 1809, Ephraim McDowell gave us ovariotomy. A number of Americans did the operation before. John Clay, in 1843, did the operation in England. Brain surgery had its origin in America. Vaginal hysterectomy was done successfully nearly two hundred years ago, and we have continued to do it successfully. It is one of the easy operations. We do it before breakfast and after breakfast, without mortality. And so I have great pleasure in alluding to what America has done for surgery. But I feel that surgery here, as elsewhere, is in its infancy. Its possibilities are great, and I want the educational centers to take more interest in the youth. The future belongs to the youth of the country. The chloroform rag has been prescribed, and that simply means that the lay people and professional people who are advanced in years appreciate the fact, that it is the young men of the age who are to do things. In our navy, at present, the average age of the men behind the guns is less than 22, and they have reached almost a maximum efficiency in marksmanship. For instance, running at a speed of ten knots an hour they hit a target ten times in less than three minutes. That means that the Japanese or the Spanish navy would disappear in less than a minute. That has been accomplished by the truant boys of the country, not by the flower of the youth of America.

I know, from experience and observation, that the great teachers of this country are wasting material and are not doing the teaching and imparting the knowledge that they should; nor are they putting as many young men to work as they should. We are going to have hospitals at every cross road where there are 2,000 or more inhabitants; we are going to have a policlinic. The policlinics of New York and Chicago will cease to exist except for those cities. At the cross roads they are going to have their own policlinics, so that it is important that we should educate and send a better class of men to the villages and to the cross roads, men who have served an apprenticeship. I have sent them to such places in good numbers. I have repeatedly sent a hundred men to their different homes who have written me a hundred letters telling me that the first one hundred patients upon whom they operated recovered. One hundred men, one hundred primary operations, and one hundred recoveries. Think of it!

Chicago has contributed so much to scientific medicine, so much to pathology and surgery, that you are attracting at present the attention of the world. You are talked about as scientific physicians and surgeons and as teachers, and I entreat you to go on with your important work.

A CASE OF LEPROSY.*

DR. E. A. FISCHKIN AND DR. E. C. SEUFERT,
CHICAGO.

The patient, a fruit peddler by occupation, is a native of Russia. He comes from the Baltic provinces, near Riga, from a district where leprosy is endemic. He is 26 years of age and has been in the United States 12 years, having lived in Chicago all this time. His illness dates from April, 1905, up to which time he was healthy and never had any skin diseases. If we believe his statements, he must show an incubation period of at least 11 years. This period is not extraordinary in leprosy. Cases are on record with an incubation period of 20 and even 40 years.

Family History.—There is no history of any hereditary taint in our patient. His father died at the age of 55, from some acute disease which had lasted only three weeks. His mother is now 61 years old and is healthy. Three brothers and one sister are in good health.

Personal History.—When we read the reports and discussions of the American Medical Association on leprosy cases, we are surprised to find the almost general statement that it is hard to get a true history from a leper. They all try to mislead and to deceive you for the purpose of inducing you to make a wrong diagnosis, and as soon as you find out the true character of their disease, they leave you and go to somebody else who is ignorant about the condition and whom they can again tell their stories. It was so with my patient. He was seen and treated by Drs. Hyde, Montgomery and Ormsby and by Dr. Zeissler and Pardee, but when he came to me last August he told me I was the first dermatologist he had appealed to. He tried to mislead me into a diagnosis of syphilis. His first complaints were about some lesions on the penis. He gave a history of a sexual exposure in March, 1905, from which he contracted gonorrhœa and, simultaneously, some spots appeared on the leg from which the present disease has developed. Previous to that time he was always well. When a boy, he attended the public schools of his native town. On questioning, he admitted having had some itching eruption on the arms and legs at the age of 14, just before coming to America. It had lasted some three or four months and, while on boat, it had entirely disappeared and he had been perfectly well up to a year ago. He denied having experienced any prodromal symptoms before the outbreak of the eruption, and admitted only a feeling of debility and quite troublesome itching, which is a characteristic sign of the invasive period.

Status Præsens.—Examination of the internal organs did not reveal any abnormal conditions. The patient, when he first came to me, looked very anemic, his pulse was weak, but there were no abnormal conditions of the heart and no murmurs. The spleen and liver were not enlarged. No adenopathy. A blood examination showed hemoglobin, 95 per cent.; 5,200,000 reds to 10,000 whites. A differential count showed normal conditions. There were no plaques or ulcerations in the mouth and the

* Read before the Chicago Medical Society, Nov. 14, 1906.

patient did not show any visible signs of rhinitis and apparently no excessive nasal or buccal secretions. The skin over the extremities, even in parts free from eruptions, was sallow, thin and, in many places, looked like a senile skin and showed a very weak resistance. An adhesive plaster strip, which was fastened around the arm to hold a bandage after excision of a nodule for microscopic examination, produced a deep excoriation, which took a long time to heal. The eruption was mainly tubercular in character and covered most of the unexposed parts of his body. The face was almost free of leprous manifestations. He could pass and is passing in the crowd unnoticed. But if you pay closer attention, you discover characteristic signs of leprosy. There is a circumscribed, infiltrated area about 1 by 2 c. m. on his forehead, elevated about 1/16 of an inch above the surface of the skin, of a light yellowish

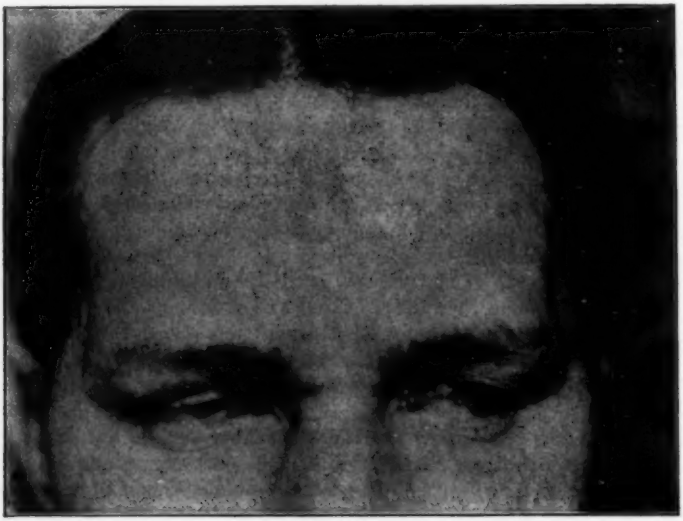

Figure 1.

brown color and of moderate consistency. On looking closer, we discover a most characteristic sign of leprosy, the thickened overhanging eye brows, due to subdermal infiltration of the lateral half, which, however, feels soft on touch and which gives to the countenance a peculiar morose appearance and is in this case only a suggestion of what is termed the leonine face. You notice the alopecia on this part of the brows. The patient himself is aware of the condition and has noticed that his eyes are deeper set now than they were before.

On the back of the neck there was a rather macular eruption, consisting of brownish, slightly elevated plaques with indistinct margins and of which the patient complained that they were very itching. The regions most affected are the extremities, the extensor surfaces of the arms and the outside of the thighs. The arms were dotted with tuber-

cles the size of a lentil to half a cherry. Most of them are rounded, of soft consistence and a dark, coppery brown color. The larger ones are covered with slightly exfoliating thin scales. A few of the largest were deeply furrowed and looked almost lobulated. The smaller ones are flat, look almost like syphilitic papules, but less hemispherical, very smooth

Figure 2.

and shiny on the surface, and showed a deep varnished or glazed color as if they were covered with oil. On the flexor surface, there were less tubercular (except on the wrist) and more diffuse infiltrations in regions of the elbow, of the characteristic brown color with deep lines and furrows looking almost like a lichen ruber rugosus. You see here such a plaque

winding around to the flexor surface. You see also the shriveled senile atrophic condition of the healthy skin.

The lower extremities are affected in like manner, though localized more on the upper than on the lower leg. You see also a few tubercles on the glans and the corona penis, a fact which is not very frequent,

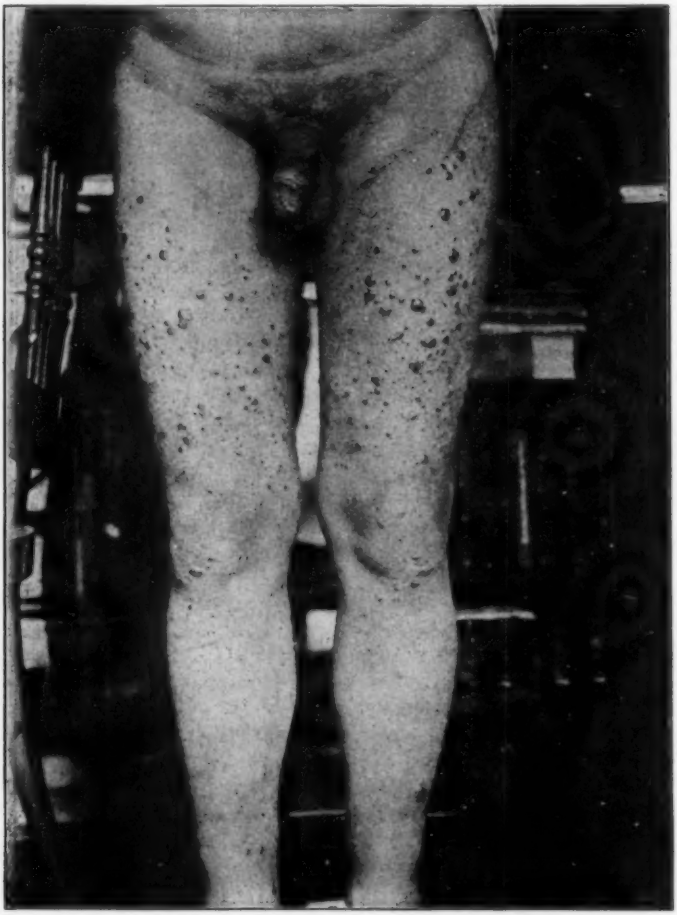

Figure 3.

which makes most authorities say that tubercles never occur on the glans. On the upper parts of the legs, there were streaks of gyrated bands of infiltration running over the cristæ osis ilei to the back.

During the treatment, I should say about two weeks after the patient came under my observation, there appeared a pemphigoid eruption, bullae

and vesicles the size of a pea to half a cherry, containing a clear serum. They appeared suddenly, without any sensory symptoms, lasting a few days, after which they ruptured spontaneously, leaving superficial excoriations which healed without trouble. At the same time there appeared

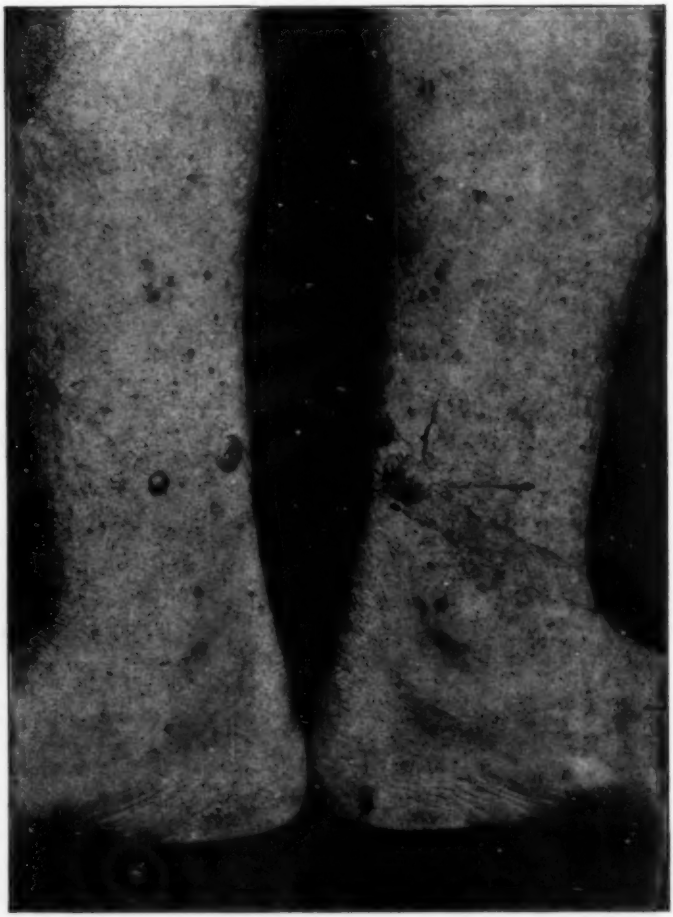

Figure 4.

over the ankles on the anterior surface diffuse brown infiltrations, which, on touch, could be felt consisting of subdermal nodules.

The nates were covered with groups of characteristic tubercles. Above them, in the lumbar region, were large circinar infiltrations, connected by somewhat irregular gyrate streaks and running out over the cristæ osis ilei to the anterior parts.

The abdomen was for a long time free from manifestations, showing only a group of small tubercles near the umbilicus. But towards the end of the patient's stay under my treatment, there appeared suddenly a number of large brown somewhat raised diffused areas of erythema leprosum or leprous roseola, which looked somewhat like a syphilitic

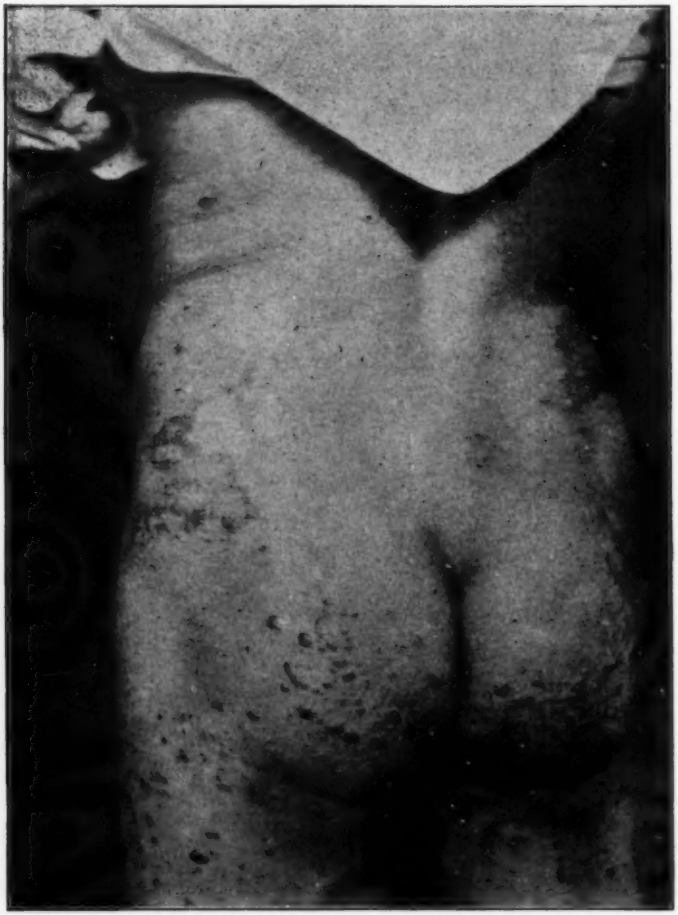

Figure 5.

roseola, the spots only being much larger, 2 or 3 inches in diameter, more mahogany brown in color and infiltrated. Examination of the thermal and pain sensation revealed distinct circumscribed spots of analgesia on the ulnar side of the left arm and on the outside of the lower leg. Sensation of heat and cold seemed to be normal. We must therefore diag-

nose this case as one of lepra tuberosa, which is beginning to exhibit mild features of the anaesthetic form.

Diagnosis.—The diseases which here come under consideration for differential diagnosis are the infectious granulomata, viz., syphilis and tuberculosis of the skin, especially lupus. The syphilitic tubercles are much smaller in size, have not the glazed, oily, yellow-brown color, are more limited in number and tend to occur in segmental crescentic groups. They are also less stationary and, in course of time, ulcerate or become absorbed. They are never accompanied by erythematous infiltration as we have seen here.

The tubercles of lupus are not universal, are mostly confined to the face, are much smaller, more soft and have the characteristic apple-jelly color. Moreover, they are of slower development and frequently spread from one center, leaving characteristic scars. There is only one disease with which this case could be confounded, viz., granuloma or mycosis fungoides in its atypical form, the so-called *mycosis fungoides d'emblee*, and, for some time, I was not certain about the differential diagnosis, which can be ascertained only by the microscope. For this purpose I excised a tubercle and gave it for microscopic examination to Dr. Seufert, who has found the bacillus of leprosy and who will report to you on his findings.

Treatment.—Owing to the fact that the treatment of leprosy consists mainly of hygienic measures, which I could not employ on this poor fruit peddler, and, having in view the indorsement of *x*-ray treatment, which was made by Lassar in Berlin, Neisser in Breslau, Wilkinson in Manila and others, I have put him on a quite vigorous *x*-ray treatment. He had daily exposures by which each part was treated twice a week, but I can not say that I have seen any beneficial action, though the treatment was carried on until the skin showed a fairly strong reaction. Some tubercles, especially on the wrist, seemed to shrivel and disappear but others came and, on the whole, there was little improvement. At any rate, the *x*-rays, notwithstanding their visible action on the skin, did not suppress or retard the onset of new eruptive symptoms as manifested by the pemphigoid and erythematous eruption which appeared under my observation. Besides the *x*-rays, I gave him general tonics like iron and strychnia, chaulmoogra oil and a pyrogallic acid ointment. But the time which the patient stayed under my treatment was too short to speak of any noticeable effect of the treatment. I have now lost track of him. He promised me somewhat reluctantly to come here for demonstration two weeks ago, but when the hour came he did not appear and has never come back since.

The Significance of This Case.—Leprosy in Chicago is no more a rarity. Almost every dermatologist of this city has seen exhibited or published cases of leprosy. We have read, in this week's number of the *Journal of the American Medical Association*, that there were 278 lepers in the United States in 1902, and there must be about 300 by this time, an amount sufficient to cause apprehension. If we take to heart the warning of Dr. Bergman of Riga, who says that in that city leprosy was

unknown 30 years ago and that it has now a colony of lepers and the necessity to keep up a leprosorium, we must admit that the presence of lepers among us constitutes a grave danger. Especially dangerous are the tubercular lepers, who carry myriads of bacilli in their skin and mucous membranes. Patients like the one we have seen, patients who do not exhibit the stamp of leprosy on their face, patients who look comparatively well and who, by their poverty, are compelled to live in narrow, filthy surroundings and to mingle with large numbers of equally poor people, are the most dangerous. But what shall be done with them? This problem, which is as old as history, is still awaiting its solution. Dr. Pusey will deal with this social problem. But besides the social embarrassment the leper places perplexing problems to the physician to whom he applies. What shall the physician do with him? Has he a right to treat him and expose his other patients to danger without warning them? Has he a right to report him to the proper authorities without betraying the patient who appeals to him for medical help and help only? And what can the authorities do with him? They will carry out the command of the old Bible to "cast out the leper," but they have no place to keep him, and what they will do and what they were doing is to chase the unfortunate from town to town and from state to state until deplorable events occur, such as have taken place a few weeks ago in West Virginia. More than in any other case, the physician is confronted here with grave problems portent with danger and weighing heavily upon his conscience.

Pathological Examination.—(By Dr. Seufert.) Since the communications of Hansen and Neisser, in 1880, no doubt remains that leprosy is of bacterial origin. It may be placed in the same category as tuberculosis and syphilis, because they all three produce connective tissue nodules. The bacillus gains entrance into the body, in the great majority of cases, through the mucous membrane of the nose; in fact, Sticker claims that this is the portal of entrance in all cases. The bacillus is a non-motile, slender organism from 4 to 6 micromillimeters long and in breadth from ⅛ to 1/15 the diameter of a red blood corpuscle. It is slightly shorter than the tubercle bacillus, which it otherwise closely resembles. The ends are frequently pointed and it is sometimes thickened in the center. Spores have not been found. The bacillus is found in enormous numbers in the nodules which occur on the skin, mucous membranes and in the internal organs. Many have a beaded appearance; these have been interpreted by Babes as degenerating forms, by Impey as artefacts produced by staining. I am inclined to believe from a careful study of our sections, that Babes is right. Around isolated bacilli, we find a clear homogeneous area which is the result of the secretion of a mucoid material by the organism. This can best be observed when the bacilli are grouped together in masses so that larger quantities are produced.

The leprosy bacillus, like the tubercle bacillus, belongs to the acid-fast group. It takes the stain more readily than the latter, but also gives it up more readily. It stains well by Gram's method. The ordinary

Ziehl-Neelsen method is a very suitable one for quick and accurate results, the bacilli are colored red and the cell nuclei blue; the masses of red-stained bacilli can even be seen with the low power of the microscope.

Many endeavors have been made to cultivate this bacillus upon artificially prepared media, but, in spite of modern methods, improved apparatus, and refined media, few claim to have met with success. Perhaps the work of Carasquilla along this line ought to be mentioned; he took a drop of serous fluid from a lepra nodule and transferred it to coagulated human blood serum. After 24 hours incubation in an oven, the first colonies appeared as white or yellow spots of an irregular, round form. On microscopic examination, the bacillus appeared in two forms, in long, thin rods with a clear center, and as short, thick, almost elliptical rods, which become surrounded by a membrane and eventually become flagellated. He identifies them as the lepra bacilli on account of their acid-fast properties, their tinctorial and morphological properties, also on account of the reaction produced by an injection of filtered culture into horses.

Attempts to inoculate leprosy into the lower animals have so far proved unsuccessful. If a piece of leprous tissue be introduced subcutaneously in an animal, such as the rabbit, a certain amount of induration may take place around it, and the bacilli may be found unchanged in appearance weeks or even months afterwards, but no multiplication of the organism occurs.

There are two chief forms of leprosy. The one, usually known as the nodular or tubercular, is characterized by the growth of granulation tissue in a nodular form or as a diffuse infiltration in the skin, in the mucous membranes, in the internal organs, etc., great disfigurement often resulting. In the other form, the anesthetic, the outstanding changes are in the nerves, with consequent anesthesia, paralysis of muscles, and trophic disturbances.

As the case under observation is one of nodular leprosy I will consider only the changes observed in this type of disease. To the naked eye, the lepra nodules present, upon section, a grayish or yellowish, semi-transparent, uniform appearance, similar to other inflammatory formations. They are not as clearly defined as in tuberculosis or syphilis, but are always better supplied with blood and, consequently, less apt to undergo coagulation necrosis. There is no caseation of the leprous nodules and the ulcerations depend more upon traumatic injuries and secondary infection than upon retrogressive changes.

The first appearance of the nodes is frequently preceded by the occurrence of hyperemic spots, which disappear, leaving behind them pigmented areas, which begin to enlarge until a walnut-sized node is formed. The nodes may remain isolated or may become confluent. They consist of granulation tissue, which raises the epidermis up and extends into the subcutis below. This tissue is in abaundance around the hair follicles. It is composed of masses of large, spindle-shaped and

stellate fibroblasts or epithelioid cells. The epidermis covering the leproma or nodule is reduced to three or four layers of cells. Some authorities say that the unbroken epidermis does not harbor the bacillus, but our sections show that they can occasionally be found in this structure, having probably been carried there by the leucocytes. The papillæ of the cutis are obliterated and replaced by fibroblastic tissue.

Each nodule has the following characteristic structures: 1, Virchow's lepra cells; 2, formations called globi by Neisser; 3, giant cells. The so-called "lepra cells" of Virchow are large vacuolated cells containing large numbers of bacilli and nuclei of endothelial cells. These cells are now considered thrombosed lymph vessels that are filled with

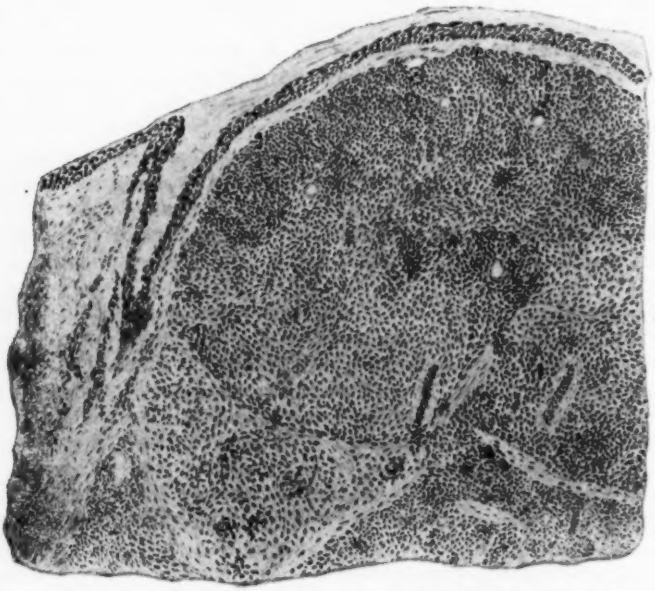

Fig. 6.—Stained with hematoxylin and eosin. Low power drawing of part of a nodule showing the reduction of the layers of the epidermis to a few cells. The papillary layer of the cutis is obliterated. The nodule is not well defined, and its stroma is composed of fibroblasts. Blood vessels are seen in several places.

bacilli and proliferating endothelial cells. The large formations known as globi are composed of many nuclei in various stages of degeneration, cell detritus, masses of dead and living bacteria, surrounded by their mucoid or slimy secretion. The giant cells are imperfectly formed and contain vacuoles. Dohi looks upon these as thrombosed lymph vessels.

We have not been able to demonstrate the bacilli within the blood vessels of our sections but they have been observed by us within the walls of the vessels, causing a periarteritis. There is no doubt that the bacilli almost exclusively travel by the lymphatics. They occur not only in the

lepra cells and globi but also within and around the individual epithelioid cells of the granulation tissue. They are not found in the plasma and mast cells, but are occasionally seen in the leucocytes within the nodule.

An examination of the blood showed the following: Hemoglobin (Gower's), 95 per cent.; red cells, 5,200,000; leucocytes, 10,000.

These figures correspond closely with those of other investigators. All agree that the blood is not affected until late in the disease. A

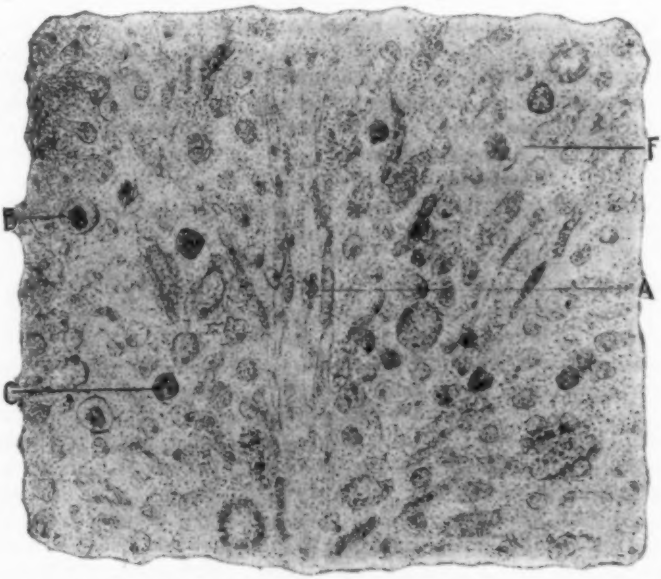

Fig. 7.—Section stained with Ziehl-Neelsen's carbol-fuchsin and methylene blue, 1/12 oil immersion. Drawing of part of a nodule showing in the middle a lymph vessel containing a mass of lepra bacilli (a), the endothelial walls of the vessel are proliferating. The bacilli are seen throughout the section in large numbers, both within and outside the epithelioid cells. Here and there may be seen the so-called "lepra cells" (b), consisting of masses of bacteria within thrombosed lymph vessels. The bacilli are stained red and the nuclei of all cells blue. A few mast-cells are also seen scattered throughout the section (c).

differential count of the leucocytes was as follows: Mononuclears, 23 per cent.; transitionals, 8 per cent; polymorphonuclears, 69 per cent.

A differential count of the granulocytes gave the following results: Eosinophiles, 10 per cent.; neutrophiles, 90 per cent.; basophiles, 2/10 per cent. No nucleated red cells were found, but a few poikilocytes were occasionally seen, a few malarial parasites of the estivoautumnal type were also present. A very diligent but unsuccessful search was made for the bacillus in the blood. Those who have studied the blood in this disease say that it is only found in the most advanced cases.

THE PREVALENCE OF LEPROSY IN THE UNITED STATES AND THE POLICY TO BE PURSUED WITH REGARD TO IT.*

WM. ALLEN PUSEY, M.D.
CHICAGO.

It may be said, broadly, that leprosy is endemic throughout the tropical and subtropical world and in all countries in which civilization has not reached the highest standards of cleanliness. Although it was universal in Europe in the middle ages, it is not now found in the heart of western Europe. It still exists in Spain and Portugal, Greece, Turkey, the Mediterranean islands, Iceland, Lapland, Scandinavia and the Russian shores of the Baltic. It is found practically throughout Asia and Africa and their adjacent islands, and it has been spread among the islands of the Pacific by the Chinese and Japanese. It is common throughout the West Indies, Mexico and Central and South America. It thus exists in many countries which furnish emigrants to the United States, and it is not surprising, therefore, that an occasional leper is found among us.

The prevalence of leprosy in North America, north of Mexico, is limited to a few foci. There has been a focus of leprosy at Tracadie, New Brunswick, for nearly a hundred years. According to Dr. A. C. Smith, of Tracadie, leprosy in that district can be definitely traced to one case introduced from Normandy in 1815. Numerous cases have developed subsequently in that district, and there is a lazaretto there containing twenty-six beds, but, as a result of partial segregation and the improved condition of the people (these are the facts to which the improvement is attributed by Smith) few of the beds are now occupied, and leprosy is diminishing in that district. Formerly there were a number of lepers at Cape Breton, Nova Scotia, but the disease no longer prevails there. There are a few cases in Manitoba among the Icelandic and Scandinavian settlers and also among the same nationalities in Minnesota. An occasional case in a Scandinavian or other northern European is found in other northwestern states. In 1900, according to Bracken, eleven cases of leprosy were known in Minnesota and, in 1903, no new cases had been reported. On the Pacific coast, both of the United States and Canada, there have been numerous lepers among the Chinese. Douglas Montgomery has reported to Dyer a list of thirty-three cases which, in Montgomery's words, does not by any means include all of the lepers in San Francisco. Montgomery has seen two lepers develop in Caucasians from contact with California lepers. One of them was a white man who lived in contact for a long time with Chinese and developed leprosy either in California or Nevada. The other was a woman, by occupation a laundress, in whose house in San Francisco a leper of the tubercular type from Hawaii had made his home. Several cases of leprosy in Chinese, presumably contracted in this country, have been seen.

The chief foci of leprosy in the United States are in Louisiana and in Key West. The Louisiana leprosy has been attributed to French Cana-

* Read before the Chicago Medical Society, Nov. 7, 1906.

dians deported from Nova Scotia, but, as leprosy has been recorded in Louisiana since the early part of the eighteenth century and was not known in the St. Lawrence region before 1810, that explanation is, of course, impossible. There is practically no doubt that leprosy has developed in Louisiana from intercourse with Spanish-American countries. The number of lepers in Louisiana is large. According to Dyer's report in 1904, over fifty cases had been admitted into the Louisiana lazaretto, and he states that cases are now found in almost every parish of the southern half of Louisiana and in many parishes of the northern half. In Key West cases are not uncommon, but their number is uncertain and, on account of easy intercourse with Cuba, probably very variable. Louisiana is the one district in the United States in which the disease is endemic and has definitely increased. It may be added that it is the one district in the United States which seems to be dangerous to persons of the better class. I, as well as others, have seen cases originating in Louisiana in people who lived under the best hygienic conditions. It is not an unusual occurrence for a leper to be discovered in any part of this country in a Chinaman or some other immigrant from a country where leprosy is endemic. Taking all cases into consideration, Dyer estimates that there are in the United States probably five hundred cases of leprosy.

The method of communication of leprosy has always been a matter of discussion. Previous to the announcement, by Hansen, of the discovery of the lepra bacillus, the question even of the contagiousness of leprosy was in doubt. Every possible influence has been invoked to account for its occurrnece. The fish theory of Mr. Jonathan Hutchinson, of London, has been one of the most plausible theories, and Hutchinson, with unexampled industry, has recently investigated this theory in all parts of the world and given his deductions in a book. He has not demonstrated that leprosy is produced by eating fish, but he has, at least, shown that practically all the world eats fish.

The lepra bacillus, discovered by Hansen in 1871 and announced in 1874, is now universally admitted as the specific organism of the disease, although this organism has not been successfully cultivated outside of the human body, so that the complete cycle of proof of its pathogenic character is lacking. Accepting the fact that leprosy is due to Hansen's bacillus, the disease must be transmitted by infection, either direct or indirect. There are many clinical illustrations that confirm this assumption. It must be said, however, immediately, that, even in endemic localities, the activity of the contagion is not great and that all of the conditions necessary for the spread of the disease are not understood. There are innumerable instances of families living together for years, in intimate contact with lepers, without any spread of the disease. Wives or husbands with leprous partners may escape the disease; some children in leprous families may develop it and others escape; so that it must be assumed that personal susceptibility is an important factor in the spread of the disease. Two other factors are also well established. One is that the disease is much more liable to be contracted in a warm climate than in a cold, and the other is that uncleanly habits of living greatly predispose to the spread of

the disease. Cleanliness, however, is not sufficient to render one immune from leprosy, in case he lives in a leprous locality in a hot climate. Illustrations of this fact are occasionally seen in lepers of the upper class returning from residences in subtropical or tropical countries.

It is excessively rare for leprosy to be contracted in the United States, except in its most southern portion. A few indigenous cases have been reported, which were presumably contracted in the middle West, but they came from leprous families of the lower class. Such cases have been reported by Burnside Foster and by Ormsby. But the entire number of indigenous cases, which have been reported either in California or the Middle West—the only parts of the United States outside of the extreme South where any cases have originated—does not amount to half a dozen.

According to Hutchinson, no case of indigenous leprosy has been seen in England. According to Hallopeau and Besnier, this also is true in Paris. According to Bronson, the same is true in New York, and it is true, I believe, in Chicago. Hansen, who several years ago examined the lepers in the Minnesota district, found that the disease was dying out there, in spite of the fact that no restrictions were imposed upon the patient. Leprosy is diminishing or has disappeared in the foci on the Gulf of the St. Lawrence, and no case has ever developed among the nuns or physicians who have cared for the patients in Nova Scotia and New Brunswick. It is the usual custom in all of the larger cities of the temperate zone, like London, Paris, Berlin, Hamburg and New York, to care for lepers in general hospitals, and that fact is the most striking evidence of the lack of fear of contagion among experts, if ordinary precautions are taken.

Even in leprous localities, the spread of the disease among those who live in civilized circumstances is extremely uncommon. According to Thompson, leprosy is on the decrease in Australia, although lepers are not restrained; and, according to Lutz, contagion, even by intimate and prolonged contact, is uncommon in families living under good hygienic condition in South America or the Sandwich Islands. Zambaco Pasha, who has had a large experience in the observation of leprosy in Turkey, has never seen a case originating from contagion. In Japan, where there are great numbers of lepers and where they have always been allowed their freedom, the disease is believed to be decreasing under improved conditions of living of the masses.

Taking all facts into consideration, I believe we may assume that there is practically no danger from the presence of a sporadic leper in any part of the United States. Such precautions as are practicable should be taken in the care of these patients, but the danger of the spread from such patients is so infinitesimal that there is no ground for the excitement which is always aroused by the discovery of a leper. Where leprosy patients exist in numbers, the situation is different and segregation should be carried out to as great an extent as is compatible with humane treatment. However, while we are resting quietly among the terrible risks which we are constantly exposed to from tuberculosis and typhoid fever and other infectious diseases, there is no logical defense for making lepers

the vicarious victims of our fear of the contagious diseases which we can not conveniently control and consigning them to the cruel isolation which popular clamor demands for them. They are practically not dangerous here at all.

In districts like Louisiana, where leprosy is active, every effort should be made to segregate the leper as completely as possible; to that end, public asylums of refuge for them should be provided, as has been done in Louisiana. These should be made as agreeable places of residence for the sufferers as possible, if for no other reason in order that lepers may willingly accept these asylums. This does not demand a very high standard of comfort, for the outside world is not a very cheerful place of residence for a leper in an advanced stage of the disease. Such treatment as is commonly accorded lepers is a reflection on common intelligence, to say nothing of humanity. If, for example, the reports are true which I have seen describing the lazaretto, or rather prison for lepers in San Francisco, the place is a disgrace to California. We are all familiar with the wretched exhibition of fear shown in the recent case of the Servian leper, who was shunted about and left to die uncared for, when he might have been taken care of with perfect safety upon any almshouse farm.

Whether anything more should be done than to provide a place of asylum for lepers depends, in my opinion, upon the district. In Louisiana it is highly desirable to segregate the lepers. In Minnesota, where the population is vigorous, where living conditions are good, and where the climate is favorable, nothing more is necessary than to keep the patients under reasonable surveillance and see that they do not live in squalor and dirt in close contact with other persons. But even in such a district, public help should be extended to the victim as fully as possible, and a place of refuge furnished them when they will accept it.

What shall be done with the sporadic leper that occasionally appears in any of the non-leprous districts of the United States? He should be treated like any other patient suffering from an infectious disease of very slow course and of the lowest degree of contagiousness. There is no reason why he should not be admitted into a general hospital or treated outside, provided the same precautions are taken that should be carried out with tuberculosis.

LUMBAR LORDOSIS.*

WITH REPORT OF CASE.

M. S. Marcy, M.D.
PEORIA.

Lordosis, as is well known, is the name of a condition in which the vertebra projects forward or a curvature of the vertebra anteriorly. Lordosis is far less common than kyphosis, which is a disease of the vertebra. Kyphosis, or a posterior curvature of the vertebra, may occur from rachitis, spondylitis deformans, osteitis deformans, Pott's disease and

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affections of a similar nature. It is the characteristic attitude in infancy and old age. Kyphosis of rachitis is most marked in lower region of the vertebra. Spondylitis deformities may involve the entire spine, but the simple posterior curvatures are most marked in the upper dorsal region. "In a number of the posterial deformities the increase in the dorsal kyphosis is balanced by an increased lordosis, and in this form there is simply an exaggeration of the normal curves of the spine, the hollow back." Lordosis is usually secondary to disease or deformity of the spine or of the adjoining members. It may be induced by flexion or contraction of the thighs, and is often a symptom of congenital displacement of the hips. It may be the result of certain forms of nervous diseases and muscular weakness.

The condition of nervous exhaustion followed by muscular weakness as a cause of lordosis is the one of which we wish to call especial attention in connection with the case reported in this paper. It is not necessary to go into minute details in reference to the anatomy of the parts involved in lumbar lordosis, but, if you will pardon me, I desire to refresh your memory as to the muscles and nerves involved when lordosis occurs. Owing to the fact that Nature has provided seven layers of muscles for the back, pulling in different directions and subject, normally, to the will of the individual, it would seem almost impossible that curvatures could occur.

On the other hand, when we remember the great number of children who inherit weakened constitutions and are improperly fed and clothed throughout their early life, it is surprising that we do not meet more deformities of the spine.

Beneath the serrati postici are arranged the muscles of the back proper, lying, for the most part, in the groove of either side of the spine of the vertebra. According to their direction, they are called vertical and transverse.

The erector spinæ muscles, whose office is extension on the pelvis, form the pair of muscles in which we are most interested at the present moment. The erector spinæ is a broad and very strong membranous sheet of a triangular shape, dividing, in the lumbar region, into three longitudinal series of muscles, which fill the greater part of the vertebral groove. It has its origin in the spine of the last two thoracic, all the lumbar and the four upper sacral vertebræ. It is continuous with the dorsi and ilio-costalis and breaks into fibers in a line obliquely upward and inward from the front of its iliac origin to the last thoracic spines. Its nerve supply is received from the external branches of the posterior division of the lumbar nerves. The psoas magnus is another pair of muscles that plays an important part in the condition known as lordosis. It has its origin by five processes which arise from the sides of the intervertebral cartilages which intervene between the bodies of the last thoracic and the five lumbar vertebræ and the adjacent part of the sides of the bodies of the vertebræ and between these processes form tendinous arches which bridge over the sides of the bodies of the first four lumbar vertebræ. The insertion is at the lower and back part of the lesser trochanter of the

femur. This powerful muscle, whose duty it is to act as a flexor of the thigh on the pelvis, passes downward and forward, passing over the brim of the pelvis. At Poupart's ligament it changes its course downward and backward to its attachment to the lesser trochanter of the femur. In its passage along the brim of the pelvis and over the lower part of the iliac fossa, the tendon, in its outer aspect, receives the insertion of the iliac muscle. They unite their strength and pass to the same destination and insertion. The sartorius, pectineus, abductor longus, abductor brevis, abductor magnus, gracilis and obturator externus, all having their origin on the pelvis and their insertion on the femur or upper and inner surface of tibia, and whose office it is to flex the thigh on the pelvis and to rotate the thigh, receive their nerve supply from the lumbar and the obturator nerves, which come from the second, third and fourth lumbar region.

Regarding the cause of lordosis, it can be readily understood, from the statements above, that the lumbar region is well supplied with nerves and hence is a very sensitive part of the spinal column. Should the lumbar plexus of nerves become irritated and oversensitive and coördination be lost between the muscles, the psoas magnus, from its superior strength, would outpull the spini recti and gradually produce this condition known as lordosis. The following case was to me a very interesting one.

The patient was a young lady, aged 23 years. I have been the family physician for a number of years, but have never known her to be confined to the bed with sickness until this attack. She began to complain, about one year previous to the termination of the disease, of severe pain in the back and sides, with no relief from lying down, pains always worse at night. Her occupation was that of a shirt maker, working early and late, sitting in a bent position. The pain became so severe in the lumbar region that she would frequently sit up straight and bend the lumbar vertebra forward for relief. Finally she was compelled to give up her work, and, while confined to her room, she stated that she felt better sitting up than lying down. After being under my care for about a month, she visited her aunt, where she remained for two months, during which time I did not see her. When she returned she could scarcely walk owing to partial paralysis, with loss of sensation of the lower limbs. In a very short time both limbs were entirely paralyzed. She was then sent to the hospital, where extension was made and a plaster of Paris jacket applied. This gave her some relief and was worn for about eight weeks, but with no improvement of the paralysis. The plaster jacket being worn out and broken was removed and she objected to having it reapplied. She was then taken to Chicago to Mercy Hospital and placed under the care of Dr. Mix. After a very thorough examination, he thought proper to apply extension of ten pounds of weight to each limb. This gave her some relief for a part of the time, but it was necessary to remove the weights for one or two hours during the day. Extension was continued for the next three months, when sensation in the feet began to be faintly perceptible. During this time the patient had but little control of bladder or bowels, and still complained of pain in lumbar region. Lordosis continued in a marked degree, notwithstanding the extension. Extension was continued

and the feet and limbs gradually became more sensitive until in about three months she could raise her feet and limbs clear from the bed and move them from side to side. As soon as sensation began to return the muscles of the thigh began to contract and flex the limbs inward and on pelvis. Spasmodic contraction was at times very severe, causing great pain. The muscles of the abdomen also contracted spasmodically, especially after eating, frequently causing the patient to vomit. The question now arose whether it was better to continue extension and try to overcome the contraction of the muscles by tiring them out and submit the patient to excruciating pain and exhaustion from the extension or to leave off extension and allow the limbs to contract. The young lady having a high appreciation of her own condition and having a strong desire to recover, the matter of extension was left entirely to her. She would bear the extension heroically for several hours, then ask to have it removed for an hour or two, and then ask to have it reapplied. She said it gave her great relief to have it removed for a time and then relief to have it reapplied. This course was continued for the next three months, when we found that she was failing beyond a hope of recovery. Then the extension was removed and not again applied during the last month of her illness. From the time that she became paralyzed and was confined to her bed her general health slowly but gradually failed. Appetite remained fairly good throughout her sickness, bowels sluggish, bladder irritable. A partial control was gained over both after sensitiveness was regained. Sedatives were necessary when pain was severe. There was no elevation of temperature, except for a few days at a time. Temperature was below normal for the last week or two of her life. The tongue was always clean and the digestion good. Every particle of fat on the body was taken up and used by the system, and the patient finally succumbed from inanition on February 6. A partial postmortem was granted and made, assisted by Dr. J. H. Bacon. We found a decided curvature forward of the second, third and fourth lumbar vertebra, which were removed and subjected to a very careful examination. Nothing abnormal in the vertebræ nor the cauda equina could be found after microscopic examination of both.

To summarize briefly: The patient, by constantly sitting in one position, exhausted the nerve force of the lumbar plexis, causing an irritation in that region and, in an endeavor to relieve the pain, lordosis was encouraged, by bending forward of the lumbar vertebræ and by so doing relaxing the erector spinae muscles, giving the psoas muscles greater advantage in contracting until lordosis had advanced to the extent which we found. When we consider that no trouble could be located in the brain anterior to the fissure of Rolando, where the motor nerves arise that control the lower limbs; that the patient had no tenderness of the spine above the lumbar region and no paralysis above that point, that there was no paralysis of the abdominal muscles and that the limbs were flaccid; that there was no history of tuberculosis nor syphilis, we believe that we can safely exclude all causes, except pressure on the lumbar plexis at or about the point of exit from the lumbar vertebra. The fact that

sensation and motion was restored, after months of extension, proves that pressure was at least partially removed. Exactly where or what that pressure was, we will leave for your consideration.

DISCUSSION.

Dr. C. L. Mix, Chicago:—The case which Dr. Marcy described was indeed an extremely interesting one. The symptoms were such that the diagnosis of a caudal lesion could be made with a good deal of accuracy. The knee jerks, instead of being exaggerated, as they would be in an ordinary case of transverse myelitis, were absent as in a peripheral neuritis. Moreover, the sensory disturbance was not segmental, but followed the pathway of the individual nerves. There was absence of the Babinski reflex, and there were none of the ordinary signs, such as decubitus, of a transverse myelitis. The signs which were present pointed very distinctly to lesion of the cauda and high in the cauda. It was one of those cases where the lesion was more in the conus than in the lower portion of the cauda.

The paralysis which was present when the young lady was brought to Chicago, was absolute in both legs. There was complete paraplegia of the type which is to be found in diseases of the lower motor neuron; that is to say, it was flaccid in type and associated with a certain amount of atrophy of the muscles. In addition to this, there was sensory disturbance and a few signs of a peripheral neuritis.

The next point, of course, was etiology, which, as nearly as I could determine, was tubercular. There was a tubercular family history, there having been one case of tuberculosis in the family. That is of minor importance, however. Much more prominent was the fact that adjacent to her in the factory where she was employed was a girl affected with pulmonary tuberculosis of rather marked type. This girl worked within two or three feet of her, and she herself attributed or was inclined to attribute her own illness to this relationship rather than to any family relationship. There was no barring out the possibility of tuberculosis of the spine, because of the presence of an occasional afternoon temperature, although for the greater part of the time she had no temperature whatever.

Subsequently she developed a bladder disturbance, although this does not occur so frequently in conus lesions as in lesions situated lower in the cauda. There was complete loss of control of the bladder, owing to relaxation of the sphincter. It became necessary to catheterize her, and catheterization was done carefully from time to time. In spite of this caution she developed some cystitis, which was, however, kept down very nicely and evidently was not the cause of death subsequently.

The improvement on treatment by extension was very marked. At the first there was an absolute inability to move the legs, but subsequently, with extension, control of the legs was regained. The superficial cutaneous reflexes were the first to reappear. The patellar reflex came back first on the left side and then on the right side. Subsequently the patellar reflex fully reappeared and became quite strong. Then there came a slight ability to move the left leg. The first movement the patient was capable of executing was adduction and then flexion of the leg on the thigh to a slight extent. After her return home, with continued extension, she finally became able to lift both legs from off the bed; so that she recovered from the paraplegia to quite a marked extent.

With proper hygienic surroundings we were able to relieve the girl's trouble to some extent, but the ultimate result could not be expected to be a very brilliant one. Some of these patients recover, but where the lesion is situated in the lower part of the cord, or where it involves the conus, the prognosis is not nearly so good as it is in the thoracic region, on account of the marked tendency to cystitis and other complications.

Dr. J. H. Bacon, Peoria:—I saw this patient after her death, and performed an autopsy on her. I removed three of the lumbar vertebræ. I found the young woman very much emaciated and the lordosis quite marked. There was nothing to suggest the trouble, except the abnormal condition of the spine. I removed the second, third and fourth lumbar vertebræ, but there was nothing to show that they were abnormal. I separated the spinal cord in this region, the region of the cauda equina, but neither the dura or other cord membranes were thickened. There was no evidence of inflammation. No increase of spinal fluid, and the fluid that was present was clear. Microscopic examination showed very few leucocytes, and the examination for tubercle bacilli was entirely negative. Examination of the bone marrow of bones removed did not show any tubercle bacilli. The bones were normal, as were also the intervertebral discs, so that it is impossible for this case to be one of Pott's disease in the lumbar region. That is out of the question.

What the diagnosis should be, I am uncertain. As I understand it, the condition improved, and that fact would help to rule out a new growth in the spinal cord. I can see no reason why a tumor of the cord should show any improvement in symptoms. The fact that the temperature remained nearly normal throughout the course of the disease would tend to rule out inflammation, except tuberculosis and actinomycosis. The history of the case tends to show that there was some disease of the spinal cord higher up in the region of the eleventh and twelfth dorsal, or possibly the first lumbar vertebra, but the segments of the cord do not correspond to the segments of the spinal column. The cord may have been affected higher up, but it was impossible to examine the cord in that region because an extensive autopsy was not permitted.

Of course, there may have been a hemorrhage in the cord, but the previous history of loss of entire control of the sphincters would be rather unusual in a hemorrhage unless there would be some external signs of it. Although it is impossible in this instance to obtain any history whatever of a syphilitic taint, it seems to me very likely that the lesion was syphilitic in character, possibly a gumma, which would explain the improvement seen eventually. I would not attempt to make a diagnosis of the case at this time, because it is difficult, but I am sure that tuberculosis can be ruled out entirely.

Dr. M. S. Marcy, Peoria:—I would like to ask Dr. Mix to explain why, if this case was tuberculosis, the vertebra and cauda equina were found to be normal. Would not the microscope have given us a clew?

Dr. C. L. Mix, Chicago:—I can not answer that question because I can not explain the case. I know that it is not a syphilitic lesion, and I know that Dr. Marcy is very well satisfied as to that. We just took a chance, as we always do, and gave potassium iodid vigorously for a while, but there was nothing in the history nor was there a single syphilitic taint in the girl or in her antecedents which could suggest such a possibility. Syphilis can be ruled out absolutely.

As far as the lesion in the eleventh and twelfth dorsal and first lumbar segment of the cord is concerned, this is quite out of the question, on account of the fact that there was no transverse myelitis.

The distinction between a myelitis and a peripheral lesion is perfectly easy. In the one case we have the increased knee jerks with the Babinski sign, and in the other case there is absence of both these signs. The only thing one can do in this case is to make a diagnosis of disease of the nerve fibers as they emerge from the cord and not disease of the cord itself. Why no tubercular lesions were found in the bones after death I can not answer. I supposed it to be an ordinary tubercular lordosis, and the symptomatology was accounted for by such a supposition. When first examined by me the spinal column was absolutely straight. The lordosis appeared subsequently.

THE TREATMENT OF INOPERABLE MALIGNANT TUMORS—CARCINOMA.*

J. M. G. Carter, M.D., Sc.D., Ph.D.

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WAUKEGAN.

I have two reasons for presenting a discussion of the treatment of cancer at this time: First, the importance of the subject, and, second, the hope that I have discovered a method which may result in saving many lives. It has been affirmed by Wutzdorff[1] that there has been an increase in the number of cases of cancer in the last few years, and some, with Sir W. M. Banks,[2] believe the increase is due to excessive meat eating. At any rate, it has been shown that many cases occur in robust and well-fed individuals and especially in the comparatively young of both sexes. It often happens that the presence of such a growth is not suspected until it is too late for operative interference, because of the fact that the appearance of the patient does not indicate the progress of the disease (Nothnagel[3]). Many cases also occur which can not be operated on because of the location, as when situated near vital organs or around important blood vessels. Then, again, there are patients who will not submit to an operation.

To the medical man has usually fallen the duty of caring for these classes of unfortunate cancer patients, and from time immemorial the professional mind has been taxed to discover some means of relief, some agent or remedy which might destroy the abnormal growth.

Boerhaave used mercury; Lefebvre (1775), arsenic; Duparcque (1850), ice; Störk (1761), conium maculatum; Weise (1829), animal charcoal; Clay, chian turpentine. Others have recommended red clover tea, tincture of thuya, tincture of hydrastis; cundurango, formalin,[4] and so on to *x*-ray and radium, Finsen's light and serumtherapy. Dennis[5] says that drugs are always a failure in cancer, and he voices the opinion of surgeons generally.

I have had no experience with serum therapy in this condition, but Senn[6] thinks it gives negative results. J. Carles,[7] however, believes good may result from it and suggests that it may be used like other sera with the hope of increasing the resisting power of the weakened organism, and Reynier[8] reports a case of successful treatment by Wlaëff. The employment of serum treatment implies a belief that cancer is caused by some micro-organism. A. Urquhart[9] thinks there is a higher cancer mortality in riparial districts than in non-riparial regions, and that this fact seems

* Read before the Section on Medicine of the Illinois State Medical Society, at Springfield, May 15-17, 1906.

1. Deutsche Med. Wochenschrift, March 6, 1802.
2. Lancet, March, 22, 1903.
3. Diseases of the Intestines, Nothnagel.
4. British Med. Jour., May 30, 1903.
5. Jour. A. M. A., Oct. 19, 1901.
6. Medical Record, July 13, 1901.
7. Jour. de Med. de Bordeaux, May 1-8, 1904.
8. Gaz. heb. de Med. et Chir., Feb. 21, 1901.
9. Brit. Med. Jour., April 4, 1904.

to support the view of probable parasitic infection. Roswell Park[10] maintains that the parasitic theory fully explains the origin of the cancer. C. B. Keetley[11] believes the cause of cancer is a living organism, and that the most frequent situations of this growth in the skin, cavities, canals and their adnexa are favorable to the parasitic theory of the disease. N. Senn[6] does not seem to believe in the parasitic theory, but, like Morris, adheres to the embryonic erratic-cell theory of Cohnheim.

O. Schmidt[13] thinks his investigations show that the protozoön parasite, which he believes is the cause of cancer, has an intermediate host in a certain fungus—*Mucor racemosus*. Lately Jacobs and Geets[14] have been led to believe that cancer may be treated by therapeutic inoculation of bacterial vaccine. Their researches have satisfied them (1) that in cancerous cachexia there is a specific micro-organism, which they believe to be the *Micrococcus neoformans* (Doyen); (2) that it is practicable to immunize the human organism by means of a series of inoculations of *Micrococcus neoformans* vaccine if these are properly controlled by examinations of the opsonic power of the blood. In all the patients they treated they observed improvement. An interesting fact noted in their experiments is that they succeeded in cultivating the *Micrococcus neoformans* from 90 per cent. of the tumors examined. By inoculating animals (mice and white rats) with young and vigorous cultures of the micro-organism they produced local and general neoplastic lesions in 30 per cent. of the cases.

If carcinoma is of parasitic origin, the serum treatment will probably be found eventually to be reliable, especially as a prophylactic agent, like vaccine virus in smallpox and antitoxin in diphtheria. Scarlet fever is recognized by the majority of the profession possibly as a bacterial disease, notwithstanding the fact that no single bacterium has been discovered which the faculty accepts as the cause of this malady. Other diseases can be placed in the same category, and perhaps it is not too much to anticipate the general acceptance of the parasitic theory of the origin of carcinoma. The earnestness with which bacteriologists are laboring gives hope to the more enthusiastic students of etiology that a demonstration of the cause may not long be delayed.

Kosinski[15] despairs of ever finding a remedy to cure cancer. All we can hope for, in his opinion, is that the discovery of its pathogeny may give us a clue to some prophylactic measures. At the present time no prominent place is given to prophylaxis in the management of cancer. Keetley[11] thinks that something can be done (1) by attending to ulcerations and beginning troubles of any kind, (2) by avoiding well-known sources of irritation, as smoking, if there are sores in the mouth, and the use of strong condiments. Trades in which irritation of the skin is common, as chimney sweeping, must be abandoned if rashes and other cu-

10. The St. Louis Review, July 19, 1902.
11. Lancet, Aug. 31, 1901.
12. Brit. Med. Jour., Dec. 12, 1903.
13. Munch. Med. Woch., lIII, No. 4.
14. Lancet, April 7, 1906.
15. Arch. Internationales de Chir., 1903, No. 2.

taneous diseases are not readily cured. (3) Such patients should use sterilized milk. G. C. Adams[16] recommends oil of eucalyptus as a specific for the arrest and prevention of the disease. Dr. Lauder Brunton[17] was the first to investigate the chemical composition of cell-nuclei from which has been secured a compound called nuclein. This substance is an albuminoid and contains phosphorus.[18] Nuclein is the most distinctive element of leucocytes, being the constituent by virtue of which the cell grows (E. R. Larned[19]). Vaughn and McClintock[19] have demonstrated that the nuclein is the germicidal agent in blood plasma and is furnished by the polynuclear leucocytes.

The possible proteid, trypsin, differs from the proteid nuclein by containing no phosphorus; but phosphorus is closely associated with the formation of zymogen granules in cells (Macallum[20]). Trypsin, therefore, might be looked upon as belonging to the proteid or nuclein class of remedies in addition to its properties as a digestant. Dr. J. Beard[21] believes that trypsin arrests or destroys the growths in experimental cancer, and that it might be a rational remedy to use in the human being; but, so far as known, no human cancer has been cured by that agent.[22] Since nuclein contains phosphorus, it is a tonic, and, besides its germicidal properties, it has other therapeutic value. That it is a rational agent in the treatment of various dyscrasiæ is attested by clinical experience. For a number of years the writer has used nuclein with such success as to lead him to hold it in high regard as an agent for the treatment of malignant growths and other low dyscrasiæ.

The bromid of gold and arsenic is another remedy which, in my hands, has seemed to prove useful in the treatment of inoperable carcinoma; but I have always used it in connection with other agents. I have had more confidence in the nuclein than in the bromid, chiefly, perhaps, because I had two cures in which I did not use the bromid, while I have had none where nuclein was not used. I have come to consider the administration of nuclein and the bromid of gold and arsenic together as a most rational and valuable treatment in cases of inoperable carcinoma. It is the combination upon which I depend rather than on either agent singly.

I have used this method of treatment in many cases with apparent benefit, but I am able to report only five cases in which the treatment was carried out as prescribed from the time the patient came under my observation until the termination of the case. One of the cases died. The other four recovered.

Case 1.—Mrs. S., aged 50. She had suffered no serious illness prior to the beginning of her present ailment, about one year before my first visit. Her first symptoms were indigestion, flatulence, heart burn, eructation of gas and similar disturbances of the stomach. The symp-

16. Lancet, Feb. 13-20, 1904.
17. Jour. Anat. and Phys., 2d series, III, 91.
18. Text-Book of Chem. Phys. and Path., Halliburton.
19. Chicago Med. Recorder, June 15, 1902.
20. Jour. A. M. A., Feb. 17, 1906, p. 512.
21. Brit. Med. Jour., Jan. 20, 1906.
22. Jour. A. M. A, March 10, 1906.

toms had gradually grown worse until pain and vomiting had supervened some weeks before. She had lost flesh and grown weak. At the time of my first visit, the patient was lying on a couch, in pain, pale and cachectic. She had been vomiting and apparently had suffered much. The ejecta having been destroyed, no opportunity offered to analyze the vomited material at that time. The temperature was normal. Temporizing treatment was adopted and the patient was not seen again for a week. Then I was summoned hastily to see her and found her vomiting and in great pain. She had not been free from these symptoms since my former visit. This time, following my directions, the vomited material had been reserved for examination. The patient had not improved. The ejecta was typical and abundant. It contained dark grumous material, mucus and remnants of food. The occurrences of vomiting were periodical. A distinct tumor could be outlined at or near the pylorus. The bowel evacuations also contained a dark material. Chemical examination showed increase of lactic and absence of hydrochloric acid. The microscope showed cell-nests and bacteria. Diagnosis, carcinoma of the stomach.

Treatment.—The local treatment consisted of the use, by mouth, of a 2 per cent. solution of hydrozone. The patient was told to drink half a pint of this solution half an hour before mealtime, lie on the back for five minutes, then turn on the right side and remain in that position for twenty-five minutes. This remedy was given for its antiseptic effect. The internal treatment was nuclein. The particular preparation was Reed and Carnrick's protonuclein. The dose was 24 grains a day. This time the patient was kept under observation for a month, until the symptoms were not quite so severe. The treatment was continued, however, and after several weeks I called to see the patient in another exacerbation of her symptoms; but this time they were not so severe. After a few days I dismissed her again, with advice to continue the nuclein, but to omit the hydrozone. Some five months later I called to see the patient and found her at work about the house. The symptoms and tumor had disappeared and the cachectic look had given place to a more healthful appearance. I did not see her again, but three years later I was informed that she was well and had had no return of the old symptoms.

Case 2.—Mrs. E. C., aged 45. She was a very active woman and had become overtired in the spring and early summer of 1898, caused by unusual demands upon her strength. Upon my recommendation, she took a vacation in the month of August for rest and recuperation. After her return home, about September 1, she entered into the rush of social and other duties as before. In about three weeks pain in the region of the appendix led the patient to make pressure there to see if she could discover the cause of her distress. She could distinctly feel a tumor, and my attention was immediately called to the growth. Fearing appendicitis, she was ordered to go to bed and a system of expectant treatment was adopted and results awaited. The symptoms did not change as time passed on, except to grow more severe. The tumor was painful, tender upon pressure; there was indigestion, nausea at times, constipation, flatu-

lence, loss of flesh and, finally, difficulty in using the right leg because of the pain and soreness in the cecal region. The pulse and temperature were normal. After the patient had suffered for six weeks, I called Dr. H. P. Newman in consultation. Upon his recommendation, the patient was taken to Marion Sims Sanitarium for operation. The operation was done Nov. 14, 1898. When the abdomen was opened, a tumor, the size of a child's head, was found located at the cecum. Infiltration was extensive, involving the adjacent intestinal, peritoneal and parietal structures. No microscopic examination was made, but the macroscopic appearances were those of carcinoma, and that was the diagnosis. The adhesions were so great that no attempt was made to remove the growth. The friends were told that the patient could not live more than three or six months. I undertook the almost hopeless task of medical treatment. Remembering the success of the treatment in Case 1, with Dr. Newman's permission, I began the administration of nuclein. For about two weeks after the operation the symptoms of obstruction grew worse. In a month she was taken home. I was very anxious to do something more, if possible, to help the patient to recover, and so consulted Dr. J. B. Murphy. At his suggestion I used arsenaura, a preparation of bromid of gold and arsenic. These two agents, nuclein and the bromid of gold and arsenic, constituted the treatment I used with this patient for the next five months. After returning home, the patient was kept in bed for a time. The entire time of keeping the reclining position was six weeks. This was a part of the treatment. One of the most annoying symptoms while in the hospital and for a while afterward was sciatica; this was on the right side and at times was excruciating. Three months after the operation the symptoms were less severe and the tumor had not increased in size. From this time the patient was out of bed and exercising as her strength would allow. Her symptoms continued to grow less severe and the tumor to diminish in size. The first of May the bromid was dropped, chiefly because the patient did not wish to take it any longer. The symptoms had subsided and the tumor was quite small. The nuclein was continued. On the first of May I went to Europe, returning about the first of July. At that time the patient was attending to her usual duties. Examination revealed the satisfactory but astonishing fact that the tumor was gone—had entirely disappeared—and there was complete absence of all symptoms or distress. It has now been seven years since the cure, the patient is very well, and there has never been any indication of returning trouble.

Case 3.—Mrs. C. L. C., aged 43, the mother of three children, the youngest 14 years old. This patient came to me in November, 1900. She had been suffering pain in the pelvic region for several months and, at the time of calling at my office, was troubled with an offensive discharge. She was cachetic and had lost flesh. Examination revealed carcinoma of the cervix and probably of the uterus and fixity of the organ. I advised an operation, in the hope that the growth might be found to involve only the uterine and adjacent tissues and that the entire tumor might be removed. It was a month

later and just before the Christmas holidays that she decided to go to Marion Sims Sanitarium for an operation. I was unable to attend the operation, but the tumor could not be removed, and only trimming and curetting was done. I did not see the patient again until Jan. 22, 1901, after she had returned from the hospital. When I saw her she was still suffering pain, but there was no discharge. The other symptoms were as before the operation. The treatment adopted in this case was nuclein and bromid of gold and arsenic. The local treatment consisted only of antiseptic douches. We did not have trained nurse service and I was continually reminded of the need of better care for my patient. The bromid was not used very long, for some reason which the patient urged. The nuclein and cleansing treatment were continued, however, as carefully as circumstances would allow. The bromid was used for about six weeks. For some weeks after the discontinuance of the bromid the symptoms remained at a standstill; but soon they began to grow worse and continued to increase in severity until the death of the patient, the middle of November, 1901, about one year from the first time I saw the case.

Case 4.—Mrs. M. H., aged 38, the mother of one child, 6 years old. She came to me in January, 1901. She was very nervous, somewhat cachectic, and suffered slight pain in the pelvis. She had slight, if any, discharge, but was losing flesh. Digital examination revealed a hard enlargement on the anterior lip of the cervix. The growth presented considerable resistance to the finger, but the uterus was freely movable. The use of the speculum showed a small cauliflower area at the edge of the hardness and a slight discharge. The diagnosis made was probable carcinoma of the cervix. The patient put herself under my immediate care, so that I could watch the case daily. The local treatment adopted was spraying the cervix with full-strength hydrozone, and the daily use of astringent and sterile douches. Internally, nuclein was used in 24-grain doses daily. A nervine and nux vomica were added to control the patient's nervous or unstrung condition. After a month of this treatment, the symptoms did not seem to be so severe. From this time the patient began to improve. In three months from beginning the treatment the hardness of the tissues had disappeared, the cauliflower appearance was removed and the pain and other symptoms had entirely subsided.

Case 5.—Mr. M. L. E., aged 55, a teamster. He had been strong and well and usually free from any ailment except a diarrhea until about a year before I saw him. The first intimation he had of serious trouble was in March, 1904. At that time he had pain and diarrhea. A physician was called and discovered a tumor in the region of the sigmoid flexure. After recovery from the temporary illness, he sought advice concerning the tumor; and, although he visited several surgeons of note, no one seemed willing to remove the growth, and their opinions gave him no hope of final recovery and little expectation of temporary relief. Most of them refused to operate, saying that the tumor was probably cancer and he would be better off without an operation.

He came to me in January, 1905, and I found the following conditions and symptoms: He was cachectic, was losing flesh and had a

tumor in the region of the sigmoid, about the size of a child's head, which was tender on pressure. He had sharp, cutting pains in the tumor, suffered from flatulence, and had a diarrhea with scybalous feces. He came to me because of my success with Case 2, of which he had heard. I advised an operation. He was willing to submit to one, but said that no one whom he had visited would agree to do it except Dr. J. B. Murphy, who was willing to operate upon request, but could not advise it with any hope of success. He returned to Dr. Murphy and was operated about January 25 at Mercy Hospital. Upon opening the abdomen a tumor four or five inches in diameter was found at the sigmoid flexure. The infiltration into the adjacent structures and the adhesions were so extensive that removal was out of the question. The diagnosis was carcinoma of the sigmoid. The wound was closed and the patient returned to bed. About the 20th of February he came to me again, and on Feb. 22, 1905, I began medical treatment. I advised him to return to bed, which he did, and remained in bed for eight weeks after the treatment was commenced. The treatment was bromid of gold and arsenic, 45 drops, and nuclein, 36 grains, daily. By the 1st of May, his pain had ceased, the tenderness had diminished and the tumor had ceased to grow. By the 1st of July it was plain that the tumor was slightly smaller. He was permitted to return home on September 1. About the middle of October he came again to my office. The tumor had entirely disappeared and all symptoms had subsided, including the diarrhea. Dr. Murphy saw the patient soon after and confirmed my statement that the tumor had disappeared. A letter from the patient last month states that there has been no return of any of the symptoms—seven months after he was pronounced cured. He is in better health than for many years.

January, 1907, one and a half years after the cure was completed, he is in splendid health.

In presenting the foregoing cases, the author does not suggest that he has found an infallible cure for cancer, but rather that such results must convince us that cancer may be placed on the list of curable diseases. The treatment, to be successful, requires great care in carrying out the method. If the remedies are carelessly administerd, satisfactory results can not be expected. In all serious cases and internal tumors, I advise remaining in bed for weeks, depending upon conditions in individual instances. The bromid must be gradually increased. Few patients will bear large doses from the beginning.

MULTIPLE SCLEROSIS, WITH REPORT OF A CASE.*

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CHICAGO.

Multiple sclerosis is a comparatively common disease of the cerebrospinal nervous system. In some communities on the continent of

* Demonstrated before the Chicago Neurological Society, Dec. 6, 1906.

Europe, it ranks next to tabes in point of frequency. We have been told recently that it is more frequent in our own country than we have been accustomed to believe. Be this as it may, we are certainly better qualified to diagnose the cases since we have become more familiar with the atypical forms of this polymorphous disease. Multiple sclerosis, like hysteria among the functional neuroses, appears under so many guises that only a Charcot could have created something like order out of its chaotic array of symptoms. He has given us the tripod of nystagmus, scanning speech and intention tremor, to which spastic gait has been added as a fourth classical sign. Numerous observers have quite recently widened our knowledge of this disease, enabling us to recognize the atypical cases almost as readily as the typical ones.

The following case is a good example of multiple sclerosis in which typical and atypical symptoms occur in great profusion.

CASE.—A. B., aged 23, clerk, was first seen on Aug. 11, 1905.

Family History.—Grandparents on father's side died at 73 and at 68 respectively; grandfather had atheromatous arteries and grandmother was a nervous woman. On the mother's side, the grandfather reached the age of 83; grandmother died at 45 from an excess of uric acid (?) Mother is still living and somewhat nervous. Father is healthy, but shows quite a degree of arteriosclerosis at 52. An only sister died of summer complaint at eighteen months. There were no brothers. The collateral branches are free from nervous disease.

Personal History.—Patient had the ordinary diseases of childhood and was subject to nasal catarrh, but he never suffered from any nervous complaint until the beginning of the present trouble. About twelve years ago he developed paralysis of the external rectus, with diplopia, which disappeared in two to three months. One year later, he was accidentally thrown off a moving van. He fell to the ground, sustained a slight trauma of the head and was picked up in an unconscious state. There was rapid recovery, but the parents noticed that he had become nervous after the fall. As he made slow progress in physical and mental development, he was sent to a military academy. About four years ago, while at that school, he suddenly felt a weakness in his legs, and particularly in the right foot, which felt stiff and clumsy. This attack passed off after a short time. About two years ago he had a different attack; this time there was no weakness, but he experienced a sensation of numbness and tingling in the right half of his face, including the ear, which paresthesia rapidly extended over his right arm and leg. There was also a dulling of the pain sense in the same area; a pin prick was perceived as touch and not as pain. The entire attack of what might well be called a sensory hemiplegia lasted one month and was shortly followed by appendicitis. He was operated on and made a good recovery. Shortly after the operation he became exceedingly nervous and began to tremble all over his body. One year ago, after a lengthy vacation, he developed burning sensations in his feet and his nervousness became more accentuated. Last winter he had a transient weakness of the right hand; for about twelve hours he was unable to flex the fingers into the palm of the hand. This soon passed off, until about ten days ago, when the fingers of the right hand again became weak, and a feeling of numbness was experienced over the left thigh and leg, but no pain. Constipation has always been a prominent symptom. The bladder functions have occasionally suffered in the shape of frequent attacks of urination. Of late, vertigo has been quite troublesome, although short vertiginous attacks have occurred one or two years ago.

Examination.—Patient presents a silly, vacant expression of countenance and is rather poorly nourished. His gait is spastic and reeling. Strength is not impaired in the upper extremities, but the right hand is not as strong as the left. Abdominal and cremasteric reflexes are absent. The deep reflexes are all markedly accentuated. Rectus clonus is indicated and ankle clonus well marked on the

right and only indicated on the left side. Babinski's toe sign is present on the right, but cannot be elicited on the left side. Intention tremor is distinct in fingers and tongue; and in the muscles supporting the head. Sensory disturbances are slight; touch and pain senses seem normal everywhere; muscle and joint senses are slightly perverted in right foot. Nystagmoid movements are seen when the patient looks to the extreme right or left. Ocular reflexes and fundi are normal. Speech is defective, in that there are ocasional explosive utterances, and in ordinary conversation it has a tendency to approach the scanning type. Mentality is below the average. There is a tendency to euphoria, and, at times, depression is the prevailing mood.

SUMMARY.

Intention tremor, scanning speech, nystagmoid movements, exaggerated reflexes, Babinski sign, transient motor and sensory palsies, attacks of vertigo, insignificant objective sensory disturbances, slight and transient sphincter trouble, remission and intermission of symptoms, absent abdominal and cremaster reflexes—are symptoms that make this a case of the typical Charcot type of multiple sclerosis, and, besides, satisfy the demands of modern authors. The question of trauma as a cause in this case can be disposed of by recalling that the first symptom—an external rectus paralysis—occurred one year prior to the fall. If any influence is to be attributed to the trauma at all, it can only be that of hastening the latent processes and not of actually causing them.

In conclusion, I wish to record my experience with the various drugs recommended in this disease. Strychnin, iodids, arsenic, iron and other so-called tonics do not seem to act beneficially. The best single drug for palliative treatment I have found to be sodium bromid in doses from 15 to 20 grains three times daily. It has a tendency to relieve the extreme nervousness and often gives the patient a greater feeling of security in walking. Several patients have repeatedly assurd me that "that salty medicine" has done them more good than anything they ever took. The young man whose case I reported has been given sodium bromid with the result that he has been more comfortable than under any other form of treatment.

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JANUARY, 1907.

CONFERENCE FOR STATE CHARITABLE INSTITUTIONS.

We would call attention to the communication, on another page of THE JOURNAL, from Dr. Frank Billings, President of the State Board of Charities, telling of the recent conferences on state charitable institutions.

Let every physician in the state read carefully this communication from the President of the State Board of Charities, and then constitute himself a committee of one to see or write to his representatives in the next General Assembly urging them to make the appropriations recommended by the conference and endorsed by His Excellency, Governor Deneen. Let the president of every County Medical Society throughout the state call a meeting of his society, that that body may by official action also serve notice on their representatives that it is the sense of the medical profession in each particular locality that the recommendations of the conference be carried out. Such official action by such influential organizations can but have great weight with the members of the General Assembly when these questions come up before them.

It needs no argument to convince the medical profession of the state of the urgent necessity of the various objects recommended by the State Board. Illinois must not lag behind in caring properly for her thousands

of epileptics, for her thousands of victims of tuberculosis, and in furnishing the life-saving, but expensive, diphtheria antitoxin. She can well afford, and ought, to spend the money necessary to make proper provisions for these classes of patients. The men at Springfield who manage her affairs will see to it that money is appropriated for these objects if they can be made to feel that they have the approval of their constituents, especially of those constituents best fitted to judge of the worthiness of these objects, i. e., the members of the medical profession.

The time is ripe for the various steps proposed by the State Board of Charities. The personnel of the board is evidence of Governor Deneen's attitude toward such matters. He has appointed on the board two physicians known throughout the state for their integrity, disinterestedness, capacity for affairs and for their generally strong character. He has appointed as lay members men and women of equally strong character, and all are willing and anxious to work hard for the best interests of the state at large, unhampered by outside political interference. They have been studying thoroughly and earnestly the needs of the various state institutions and are well qualified to say what are these needs. We can safely follow their lead in asking for the appropriations which they recommend. Let us back them up by serving notice, each and every one of us, on our respective representatives at Springfield that they heed the suggestions made by our State Board and vote the money necessary to carry them out. Thus will they place Illinois well in the van as a state progressive in affairs medical and scientific as well as in affairs material, and make her an educational center to which other states in the Union will look for leadership in the management of institutions for dependent citizens.

FEES IN CARROLLTON AND GREENE COUNTIES.

Greene County, Illinois, is one of the most fertile counties in the state and is inhabited by people of more than usual prosperity, and the medical profession of that county is well educated and for many years has had a county organization. It seems that there has been great laxity in the past in regard to the compensation of physicians. This finally became so intolerable that the members of the profession in the County Society, at a recent meeting, decided to make a change and to advance the prices for medical services to a modern standard. This action has been denounced by the lay press in the most unjust and unreasonable manner. The society has been called a medical trust, and the impression is given out that people are being charged an exorbitant sum for medical services. The dispatch that we have seen referring to this matter is dated at Carlinville, county seat of a neighboring county, and not from Carrollton, the county seat of Greene County, and it may be that the feeling

has been exaggerated in this dispatch. We hope that the profession of Greene County will not be deterred from carrying out its plans by the remarkable abuse which has been heaped upon it, but will demand fees commensurate with the importance of its work and responsibilities connected therewith.

BEWARE OF THE SCOPOLAMIN-MORPHIN ANESTHESIA.

Owing to the remarkable statements of a certain St. Louis surgical writer, quite a number of members of the profession in the Mississippi Valley have been using this form of anesthesia. Up to the present time we have not learned of any disasters from its use in this part of the country, but that it is a combination which, if used at all, should be used with the greatest of care, we are well convinced. Dr. H. C. Wood, Jr., of Philadelphia, in the December issue of *American Medicine*, has taken this matter up and presented a strong indictment against the use of it in any case. He has collected from literature 1,988 cases; in these there have been twenty-three deaths, of which, after careful reading of the descriptions of the symptoms and the author's own conclusion, he decides the deaths due to the anesthesia in nine cases. The mortality in this method reaches, therefore, the astounding figure of one death in 221 anesthesias. In comparison with one death in 15,000 from ether, hyoscin-morphin anesthesia becomes a veritable slaughter.

In view of the fact that this combination for the production of surgical anesthesia is scientifically irrational, and has yielded a mortality of over four per thousand, and that in 69 per cent. of the cases the anesthesia has been unsatisfactory, Dr. Wood thinks it must be either a very bold or a very ignorant surgeon who will persist in its use.

A FURTHER PREACHMENT.

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PRESIDENT OF THE ILLINOIS STATE MEDICAL SOCIETY.
GALESBURG.

It is interesting, when one thinks of it, that there is nothing higher or lower now in things medical in this country than the County Society. It is the unit from which medical organization will continue to grow for the coming centuries. This plan of organization, arranged for with so much skill and foresight by the committee of the American Medical Association, however, makes many demands on the individual physician to develop his work in order to match in completeness the plan of organization outlined by this committee.

The practice of medicine to-day in no way differs, so far as the actual work is concerned, from what was true generations ago. The scientific side has kept pace with or even distanced the work in other branches of

human endeavor. But the direct application of the science of medicine, as an art, to the individual patient by the physician working alone has not advanced as it should. No matter what the early efforts of a physician may be to give his patient the latest and best in the treatment of his disease, the final effect of the practice of medicine in the greatest number of instances resolves itself into the mere seeing of patients. The physician to-day who sees the most patients is the one who is usually considered, both by the lay and the professional mind, the most successful. But is he? What is the final effect of merely seeing patients upon the individual practitioner of medicine? He becomes a routinist both in habits of thought and in applying the art of his profession. He who permits himself to drift into a *status quo,* where he merely exists on the routine demands of his work, never realizes the full measure of his possibilities, no matter what his ability or training. In the beginning it is not unnatural that a physician's desire to do the best possible for his patient, in order that the reputation obtained for good work may be the means of bringing others to him, should overshadow practically every other consideration. But too many of us never get beyond this stage, at least not until we have lost so much valuable time that the loss is almost irreparable.

How many of us have ever sat down and in cold blood figured out our relationship to the final goal that we are all going to reach some day? If we have figured on any other basis than that of getting patients, what have we included in our thought for the future? The basis of the answer to this must be predicated on the fact that when one line of action does not bring the desired results, we should recognize it, and that, too, at a period not too late to change. Now the method of staying at home (if this can be dignified by the term method) in order that we may not miss anything, especially an obstetrical case, does not bring continuous good results. It is all right for the first year or two, after one's graduation, perhaps; but persisted in it will dwarf the individual who adopts it and finally make the discontented doctor who is to be found everywhere. The "waiting for an obstetrical case" has withered more doctors than any other part of the work that is demanded of our profession. I mean this in the sense that the physician who is capable of getting and holding a large practice under the conditions which now obtain could do much more both for himself and his family, as well as for the community in which he lives, if he could get beyond the point where he is looking for patients rather than, as ought to be the case, the patients looking for him.

I said above that the waiting for baby cases had done more to destroy the initiative in many doctors than anything else. In these latter days we have added another hindrance to our progress. It can be stated in the one word "tablets." I have nothing to say about the firms that put out these "little giants." But in their ability to destroy whatever of ambition the one who uses them may have for a correct knowledge of therapeutics, ready-made tablets stand pre-eminent. The most of us do not give the brains that we have a chance to help us to better things. We do not start in as we should on some mental problem connected with our

work, and from this step to something higher until finally we reach the peaks where the ozone gives us more life and therefore greater capacity for larger things.

The genius in the medical profession is rare. I can not remember that I ever met one, but I have met lots of great big fellows who possessed and made good use of the average amount of brains which was theirs. One of the glories of our country is that they are to be found everywhere, and in all lines of work; but sadly, let it be said, they are not all measuring up to the possibilities that are in them. The big fellows who are leaders, especially in the medical profession to-day, are rarely men of more than average brain power. It is not an uncommon thing to hear surprise expressed, in after life, by those who knew them in school, that they have gone so far. There is only one explanation of their success, and it can be expressed by saying that they are willing to think. They are the ones to whom we go for new methods, not only of technic, but for suggestions for the betterment of our own work. They change their methods. How many of them are doing things as they did ten years ago? How many of us are still doing them in the same old way? If we are, it is not a far step until we are dissatisfied with everything connected with our profession; not only with what it has brought us, but with all the schemes that have been worked out for its better organization and protection. There is no profession that has a better opportunity for good constructive thinking than the medical profession, especially those of its members who are in general practice. How many utilize the time when driving between patients to think out and settle the problems which we meet on every hand not only as to our patients, but the larger ones that apply to the profession as a whole.

The writer has known for years—indeed, before he was a physician at all—a member of our profession whose name is now on every tongue the world around. He lived, and still lives, in a small country city, if I may be allowed the term. I well remember how, in the early days of his professional life, that man began with that most valuable book for every physician: Pathology and Therapeutics by J. Collins Warren, and made himself so familiar with every page that it was a part of his every-day thought. Next he mastered Gray's Anatomy, and he kept at both of these books until he practically knew every page. By this time he had a large general practice well in hand, and then he began to look around for the fellows who were doing some one thing well. When these were found, he went where they were and stayed long enough to become perfectly familiar with the things that they were doing better than any one else. This member of our profession never missed an opportunity to attend a medical society, county or state. It is unnecessary to say that he was always welcome, because he always had something to give. The experience gained at these meetings taught him to think and express himself on his feet so that to-day he is listened to when he speaks with a respect that is given only to those who are known to have made good. This man's name and his work, I repeat, are known wherever the lan-

guage of medicine is printed. As I write of him it occurs to me to paraphrase an ancient verse: To him that giveth shall be given; to him that giveth not shall be taken away even that which he had to give. He learned to utilize his time to the very best advantage; most of us learn to let time kill us. He trained his average amount of brains to work for all they were worth, and by trying he learned what he had no possible means of knowing in the beginning—that they were worth a great deal.

CORRESPONDENCE.

State Charities.

Chicago, Ill., Dec. 24, 1906.

To the Editor:—In October there was held at Springfield a conference made up of his Excellency the Governor, State Board of Charities, superintendents of the hospitals for the insane and the Asylum for Feeble-minded, and various individuals representing the medical profession, philanthropic institutions, charities, etc. The purpose of the conference was to obtain an expression of opinion as to the improvements needed in the existing charitable institutions in the state and to outline the needs of new institutions for the care of people suffering from epilepsy and tuberculosis. Very satisfactory work was done at this conference and various committees were appointed to work upon the problems of improvement of the present state institutions, to investigate the needs and the cost of proposed new institutions, etc.

On December 14 the conference reassembled in Chicago and was attended by his Excellency, the Governor, the superintendents of all of the state hospitals for the insane and the Asylum for Feeble-minded, the members of the State Board of Charities, some of the trustees of the various state institutions, by Drs. Evans, Churchill, H. I. Davis, Mr. Bicknell of the Bureau of Charities, Mr. Kingsley of the Relief and Aid Society of Chicago, and others. It will be of interest to the profession of the state to know that in reference to improvements in existing institutions the following were passed upon and agreed to unanimously by the members of the conference:

First.—The institution of a training school for nurses in all hospitals for the insane in Illinois.

Second.—The establishment of psychopathic hospitals for the treatment of the acute insane, which would include putting in the apparatus necessary for hydrotherapeutic treatment.

Third.—The improvement in the physical properties, which would include new plumbing, iron beds to replace wooden ones, making buildings safe from fire risk, improving ventilation, etc.

Fourth.—The establishment of an institute of psychopathology in one of the institutions, with branches in all of the state hospitals for the insane and the Asylum for Feeble-minded at Lincoln, the head of the institute to be under civil service control, and a suitable man to be placed

in this position to afford clinical and pathologic instruction to the medical employés of the state and later, it is to be hoped, to physicians outside of the state institutions. The purpose of this is to bring the medical service to a higher standard and to enable the institutions to produce scientific and better results in the treatment of state charges.

In addition to the improvements in existing institutions, it was agreed that the conference would recommend to the people of the state that the legislature appropriate funds for the following purposes:

First.—Fifteen thousand dollars for the free distribution of diphtheritic antitoxin for the use of the poor in the state outside of Chicago under the auspices of the State Board of Health.

Second.—Two hundred and fifty thousand dollars for the establishment of a farm or colony of epileptics. It was proposed that a farm of from 800 to 1,000 acres of land be purchased at a cost of about $80,000; that the preparation of the land for the colony, which would include the erection of a power building, making sewers, etc., should cost $50,000; five cottages to cost $10,000 each for 100 patients; these cottages to be occupied by adult epileptic patients who would be able to work and who would be employed in the first year or so of constructive work. Later, perhaps in the second year, two pavilions to hold 50 patients each, to be occupied by patients who are too young to work or from some other reason not able to do the necessary hard work of construction; these two cottages to cost $40,000. The remaining $30,000, it was estimated, would be sufficient to maintain the institution until 1909, when the legislature will meet again.

Third.—One hundred and fifty thousand dollars for the establishment of a state sanatorium for the treatment of incipient tuberculosis. The conference recommended that a tract of land of about 320 acres be purchased, which should be high land, drained and easily accessible and yet sufficiently removed from any city or large town to insure an abundant supply of pure air and water. That the buildings to be erected should be of inexpensive type and material, and that the teachings of experience in other states should be given due regard in determining the size, style and location of the buildings.

It is only necessary to say a few words in regard to the sentiment expressed at the conference concerning these three new departures in the state care of dependents. The committee on diphtheritic antitoxin showed that the state could furnish, through a reliable, non-commercial source, a reliable antitoxin at a cost of 25 to 30 per cent. of the usual price of diphtheritic antitoxin for the prevention and cure of diphtheria among the poor of the state, outside of Chicago. It was the sentiment and belief of the conference that $15,000 would furnish the remedy for two years at a saving of at least $100,000 to the state. We believe that this measure should receive the hearty endorsement of the profession.

In 1898 the legislature passed an act establishing a colony for epileptics, but no appropriation was passed to purchase land or organize the colony. It is now only necessary to secure an appropriation as outlined

above. We believe that the medical profession will be a unit in using its influence to secure this appropriation. It is, however, desirable that the proper arguments for its establishment should be used, in reference especially to its economic features. In the first place it is believed by those who have worked upon the subject that the colony should be an industrial one; that farming and the various trades should be taught to the patients so that they may in time become not only self-supporting, but later may leave the colony and make self-supporting and useful citizens; that this purpose may be carried out, it will be necessary that it be understood beforehand that the colony will not be instituted for the care of the epileptic individual who is insane, idiotic or physically incapable of learning how to be self-supporting, in part at least.

The measure would most likely meet defeat if an attempt were made to establish a colony and place in it helplessly sick and feeble epileptics, for the state would be shouldered with an enormous expenditure for the maintenance of such an institution. It is the belief also of those who have worked for this colony that if the state assume charge of the non-teachable and non-supporting class of epileptics it should be in the form of a detention institution rather than that of a colony.

It was also the sentiment of the conference that the establishment of a sanatorium for tuberculosis would not be for the purpose of affording an asylum or retreat for the helplessly sick patient, but that it should be maintained for the care of the tuberculous patient who had a hope of recovery. That such a sanatorium would afford a cure in from 10 to 20 per cent. of cases, and that the disease would be checked and restore a patient to a condition permitting him to earn his living in at least 60 per cent. more. That the educational value of such a sanatorium would be great in affording a thorough training to the patients of the necessity and importance of a generous supply of pure air, of wholesome and properly prepared food, with out-of-door exercise and of moderation and temperance in all of the habits of life. That the patient would continue these habits after he left the institution and would be a teacher in his family and in his community of the hygienic life necessary to escape tuberculosis.

In the past some of these measures have been brought before the legislature by different committees and societies. Usually there has been no coöperation and it has not been unusual to find the advocates of one measure belittling another equally important plan for the improvement of the people of the state. The result has been that all measures have failed. This year these measures have all been brought before the conference of the State Board of Charities and the people named above, and it has been agreed that all concerned will coöperate in asking that these important measures be passed by the next legislature. It is probable that we shall be successful if we can have the coöperation of the medical profession and of all other people interested in these matters. I would suggest that the officers of various county societies bring these proposed measures to the attention of the county societies and that the members

be asked to personally see their state representatives and secure their promises to favor the bills in their passage through the legislature.

Finally, an additional measure which was recommended by the conference involves the inmates of county almshouses. In many counties the insane, epileptic and feeble-minded inmates are cared for in a most primitive manner. In some almshouses these patients are shackled and confined as prisoners, and a passive cruelty is practiced which is medieval. In some counties there are no attendants, and in only one (Cook) is hospital care provided.

It is urged by all who know the conditions that all insane, feeble-minded and epileptic dependents should become state charges, leaving to the county only the care of other paupers.

The medical profession is urgently requested to urge upon their representatives in the legislature the proper legislation to correct the almshouse evils by making the dependents named above state charges.

Very truly yours,

FRANK BILLINGS,
President of the State Board of Charities.

COUNTY AND DISTRICT SOCIETIES

ADAMS COUNTY.

The regular meeting of the society was held November 12, with President Grimes in the chair. Those present were Drs. Ashton, Becker, Blickhan, Christie, Center, Ericson, Garner, Grimes, Germann, Gilliland, Hinton, Hart, Kidd, Knapp, Knox, Koch, Liesen, Lierle, Montgomery, Mercer, Nickerson Pfeiffer, Pitman, Robbins, Rice, Rosenthal, Shawgo, N., Shawgo, J. B., Spence, Schullian, Wells and Williams, J. G. Dr. Mercer of Loraine was elected to membership. Dr. Nickerson announced that the next meeting of the Western Illinois District Medical Society has been secured for Quincy.

The following paper was presented by Dr. W. E. Gilliland of Coatsburg:

PNEUMONIA—ITS PATHOLOGY AND TREATMENT.

You are all doubtless aware that our ancestors of a hundred years ago taught that bleeding was necessary in all inflammatory diseases. In their classification of disease they set apart all diseases accompanied by inflammation and called it the phlegmonous or inflammatory class. For any disease in this class they invariably let blood. They made very careful observations of the behavior of the blood after it was drawn. By these observations they were able to determine whether or not the disease belonged to this class. If it coagulated quickly and firmly, and if the edges separated from the vessel containing it and raised up, forming a cupped surface, allowing the serum to settle beneath and around the clot, it indicated to them that the blood was rich in fibrin, a condition which they considered necessary to inflammations in general. They made this philosophy apply with peculiar force to the disease under consideration. This firm and rapid coagulation of the extracted blood not only confirmed their diagnosis, but gave them the clue to their treatment as well. If the coagula were firm the disease was clearly within the phlegmonous class and the treatment must, perforce, be antiphlogistic; anything else at that time would have been criminal malpractice. I have made these preliminary remarks at this time to get your minds directed toward this highly coagulable condition of the blood as observed by our ancestors. I would not have you lose sight of it, because as you will see farther on, it cuts no little figure in the pathology and treatment of pneumonia.

Statistics clearly show us that the death rate from this disease has steadily increased in the last quarter of a century. This increase must be attributed to one of two causes. Either the disease has assumed a more virulent form, which we are all willing to admit, or the treatment has become less efficient. One or the other of these two conditions must obtain. It certainly becomes our duty to make diligent inquiry as to which of the two conditions prevails; and, if possible, to correct the error.

It matters not whether an inflammation of the pulmonary tissues be caused by the presence of a microscopic germ, from the inhalation of noxious vapors or dusts, or from any other cause whatever, this plastic condition of the blood becomes a very important factor in the development of the pathological condition found in this disease. I imagine that it is next to impossible to have a germ in a case of sthenic pneumonia without this condition of the blood. Now let us consider the pneumonia process.

The inception of the disease is an irritation in one or several contiguous air cells, caused by—no matter what. This irritation invites an increased blood supply to the part, and an increased blood pressure within the blood vessels. This increased pressure causes the transudation of the serum, highly charged with fibrin, into the air cells, where by losing part of its moisture, it becomes tenacious

mucus, discharged with difficulty in the early stage of the disease. But it can not always be discharged, in which case it accumulates until the air cell is not only blocked up, but so distended as to compress the surrounding capillaries. The lung performs one of the most important functions in the animal economy. For the purpose of aeration the blood is carried to it in a voluminous and rapid stream. Any interference with that stream immediately becomes a serious matter. This compression of the capillaries and arteries places a dam or obstruction across this stream of blood; which, like the ice gorge in the river, is subject to a very rapid accretion. As this accretion increases the irritation, the blood supply is increased, not only in quantity, but in the force with which it is supplied as well. This increased blood supply, driven into the dammed up capillaries by the sledge hammer blows of an excited heart, so increases the pressure as to force the red blood corpuscles through the cell walls, and they now appear in the sputa. The increased pressure in the blood vessels so distends them that they become auxiliaries to the air cells in compressing and obstructing other blood vessels; and thus, like the ice gorge in the river, the dam is extended and strengthened.

Right here is where this highly plastic condition of the blood gets in its most destructive work. The blood stream comes to this obstruction. It cannot pass. It backs up behind the dam, like the water in the river behind the ice gorge; and, being brought to rest, it rapidly coagulates as far back as the current has ceased to flow. These coagula are, by the force of the heart, tamped into the capillaries, which, in their turn, compress other vessels and cells. So the disease is extended; and in a surprisingly short time a whole lobe is involved; in a much shorter time than it could be accomplished by any inflammatory exudate.

But there is danger from another source. This is not the only manner in which this disease extends. Go back to the bifurcation of the artery supplying the parts, to where one artery is blocked up with a coagulum and the other filled with living flowing blood. The coagulum projects into this live current. Think you there is no danger of fragments being detached, floating away on the stream, and obstructing other capillaries; and, may not this be the way in which the disease jumps from one lobe to another, until a whole lung is involved? When a whole lung or a considerable part of it is involved, may not this coagulation extend back to where the artery going to the other lung is given off; and may not fragments separate there, float away on the current and embolize the other lung, which would account for the occurrence of a double pneumonia?

We have, then, first, the necessary highly coagulable condition of the blood; second, we have the pneumococcus, producing irritation in the air cells, exciting an increased blood supply to the parts; third, the fibrin bearing serum transuding into the air cells blocking them up; and, by their distention, compressing and obstructing the surrounding capillaries and arterioles, thus forming a dam across the blood current; fourth, a gorge of coagulated blood in the blood vessels supplying the parts which, by increasing the pressure, it compresses other vessels, thus augmenting the obstruction and extending the disease; fifth, secondary infarctions in other lobes formed by detached fragments of coagula floating away on the current to the capillaries, through which they cannot pass, so forming an embolism and starting the same process there, and possibly to the other lung.

In the diseased area the air cells are occluded, either from compression without or from transudates within, except, perhaps, near the border of the diseased area, where the compression is not complete; and from where tenacious serum, mixed with red blood corpuscles, are with difficulty expelled. Behind this, the capillaries and arteries are filled with coagula, tamped in with all the force that an excited heart could exert. This gives us a pretty fair idea of a consolidated or hepatized lung. I shall make no attempt to divide pneumonia into classes. I imagine that the several varieties found by our authors are varieties of degree, rather than of kind. The different degrees of coagulability of the blood, perhaps, has more to do with it than anything else. When the blood is very rich in fibrin we have croupous or fibrinous pneumonia. When it is less rich, and the coagula are so soft as to scarcely occlude the capillaries and the exudates are less viscid and flow-

ing freely, we call it catarrhal pneumonia. Before considering the treatment I wish again to call your attention to this coagulation of the blood in the vessels of the lungs, this veritable pulmonary thrombus. Remember that it is no simple theory. It is the actual condition that confronts us. In it resides the pathological condition we are called upon to treat. In its extension lurks the danger to our patient.

In discussing the treatment we will not take into consideration the idiosyncracies of the patient, the peculiarities of the disease prevailing at any given time nor the hundred and one complications that may arise. Each of these must be considered and met as they arise; nor will we attempt to lay down any hard and fast rules for guidance. We have been taught that the first thing in the treatment of any disease is to remove the cause; and, possibly this is a good rule, but it, too, has its exceptions. In the case under consideration the cause is the pneumococcus; and it is making us a lot of trouble. Let us go after it with all our power. Let us be revenged on him. But before we could reach it with our germicides, this damming process across the blood stream will have jugulated our patient. Jugulation is a germ in which pneumonia holds a strong hand. Besides, if we were to destroy every pneumococcus in Illinois, it would not add one jot or one tittle to the means necessary to the prevention of the extension of the disease or the removal of the obstruction.

Before considering the use of medicine in the treatment of pneumonia, I wish to call your attention to the *Vis medicatrix natura* in this disease. In the beginning the prime factor seems to reside in the abundance of fibrin in the blood. When our patient was taken sick he ceased to eat. There was nothing brought in from which fibrin could be made. While in the active stage he had a high temperature and was restless, both of which caused a rapid consumption of the fibrin on hand. In connection with this a large portion of it was lodged in the coagula in the lungs. Thus our patient, by the processes of nature, has been very rapidly depleted of his fibrin, that so recently threatened his life. Without this *Vis medicatrix naturæ* it would be next to imposible for any patient with pneumonia to get well.

I have not the least idea that our ancient brethren understood the pneumonic process as I have depicted it to you, but the very first movement they made was toward the reduction of the fibrin in the blood. They bled and bled freely. They bled until a decided impression was made. Theoretically this would appear to be all right. If a patient has ten quarts of blood in his system and you take one out you reduce the fibrin in it by 10 per cent. The immediate effects of this would appear to warrant it, but our patient is approaching a condition in which he will need the rich sustaining elements lost in the blood that has been shed; so that, if you contemplate bleeding, there are some nice points to be decided. My experience with bloodletting in pneumonia is not sufficient to warrant me in expressing an opinion *pro* or *con*.

In the first stage of a case of pneumonia there are usually two prominent indications to be met. The first is to change the character of the blood, so as to stop the further formation of coagula. For this purpose I know of no remedy that comes anywhere near equaling mercury, preferably the mild chlorid. I would give it freely until the emunctory organs were all active, until the saliva was as limpid as water. You can then rest assured that all the fluids of the body are correspondingly limpid and will flow freely through the capillaries and meshes of the tissues. The action of the mercury will be materially facilitated by combining it with one of the alkalies, soda, at first, and if the pulse begins to flag and a stimulant is indicated, ammonia later. I would push the mercurial treatment until it met the indication, or until I was satisfied that it could not be made to do it.

The second indication is to equalize the circulation. It is a self-evident proposition that when the blood in the entire system is distributed equally to every part there can be no congestion anywhere. The irritation invites an increased blood supply to the seat of the disease. This adds fuel to the first and is to be pre-

vented, if possible. The first thing usually thought of is derivatives, hot pediluvia, hot fomentations, sinapisms, and later, blisters. Our ancient brethren commenced with blisters. But our sheet anchor is quinin, full sedative doses, until we get complete relaxation. When we came to our patient we found him in a high state of tension. He was all drawn up in a knot. Every contractile fiber in his body was upon the stretch. His muscles were so tense that his limbs were rigid and his face was pinched and drawn with an expression of agony. Give quinin until it produces complete relaxation, until our patient lies as limber as the proverbial rag. Our patient suffers quite a good deal, not only from pain in his chest, but from headache and aching in his bones. This is caused mainly by this high state of muscular tension. The muscles themselves ache because of their tenseness; and the bones ache because their ends impinge upon each other with abnormal force. If the quinin alone is not sufficient to relieve this condition we will give him a good round dose or two of old fashioned Dover's powders or some eligible substitute. It supplements the action of the quinin nicely.

At this point it is really interesting to note the effects of the quinin on the sympathetic nerve, which presides over the distribution of the blood. It seems to exercise a kind of paralyzing effect. At any rate the muscular coat of the capillaries are relaxed just as the muscles are relaxed. This allows them to dilate and to give free passage of the blood to every part of the system. This, in part, at least, releases the heart from its herculean task of forcing the viscid, sticky blood through a whole system of contracted arteries and capillaries. We should keep up our treatment along these lines, meeting contingencies as they arise, until we conquer or until we are vanquished.

Frequently there is another indication to be filled in the active stage of pneumonia. The heart gets excited and runs away, acting too strongly and too rapidly so that we should control it if possible. This we can usually do by exhibiting some one of the powerful cardiac sedatives. Some use aconite, some digitalis, and some veratrum viride. I prefer the latter. I have found it one of the most powerful of all the antispasmodics and it supplements nicely the action of the quinin in dilating the blood vessels, which seem so essential in the equalizing of the circulation.

Having conducted our patient through the active stage of the disease, we are still confronted with a problem. The lung of our patient is blocked up with coagulated blood; this constitutes solidification or hepatization of the lung. This solidification seldom goes far enough to compress the nutrient arteries, else we would have necrosis. Nature seems to exercise a kind of protection over these arteries.

The problem now is, to get rid of these coagula so as to open up the lung to both the blood and the air, and allow it to resume its functions. Surgeons, I presume, would want to cut down on them and remove these coagula with a curette. We must content ourselves with a slower, though a much safer method. We will keep our patient in the best possible condition and allow Nature to do the work for us. In removing these coagula Nature does some beautiful work. They were formed when the blood vessels were in a state of contraction, and consequently were slender. Now, in the relaxed condition of our patient, the arteries and capillaries are dilated so as to allow the limpid blood to flow along them beside the coagula. Thus, the coagula are much more extensively exposed to the action of living blood than they otherwise would be. If we have been careful to prepare for this by keeping the blood slightly alkaline, we will be surprised to see how rapidly Nature will do the work. Remember that all alkaline blood will rapidly dissolve coagula.

But you have said nothing about the cough and expectoration. As a rule, if the treatment laid down is successful they will need little attention. If the cough becomes harrassing and a sedative is indicated, some one of the preparations of opium usually answers the purpose, heroin, if preferred. If the sputa are tenacious and expectoration difficult the salts of ammonia are indicated. Their action is facilitated by combining them with syrup of ipecac or wine of antimony. If

the expectoration become so profuse as to be dangerous, which sometimes occurs in the very young or the very old, the problem is rather difficult. I have seen several old persons literally drown in their own secretions, being unable to discharge them. In some cases I have gotten well marked benefit from the use of wild cherry bark, but it is usually too slow for emergency cases. This subject is such a large one that I have been able to emphasize only the important points, and in a disconnected manner.

The paper was discussed by Drs. Nickerson and Robbins and the discussion was closed by Dr. Gilliland.

Dr. Kirk Shawgo read a paper on "Exostosis of the Os Calcis," which was well illustrated by a number of skiagraphs.

In looking up the literature on this subject I am able to find but little mention of it. However, I am of the opinion that exostoses of the os calcis are not uncommon, as I have found three cases within a year, and by being interested in the subject, have heard of many more cases of painful heels that may prove to be due to the same cause. The first case I found was in Cook County Hospital, sent to me for radiographic diagnosis. A man, aged 40, complained of painful heels. Pressure on his heels caused considerable pain. He had been unable to work. He gave no history of injury or illness to suggest a cause. The skiagraph showed exostoses projecting from the inferior surface of the os calcis at the origin of the flexor brevis digitorum and adductor minnimi digiti muscles between the outer and inner tuberosity, also projections posteriorly and superiorly, at the attachment of the tendo Achilles. I was not present at the operation, but skiagraphed the feet afterward and found that the removal of the growth had been incomplete. The heels were still tender, but much improved.

CASE 2.—A man, aged 35, stated that he had been unable to work for some months on acount of pain, tenderness and swelling of his right foot. As he had a slight degree of flat foot, I had him try wearing an arch, but the relief was slight. He said his heel felt as if there was something in it and he tried to cut it out with his knife. Radiograph showed a sharp exostosis, extending downward from the os calcis between the internal and external tuberosities. Operation disclosed a hard bony spicule, about one-half inch long. This was removed and he is now free from all pain and tenderness.

CASE 3.—A young man, aged 20, had been a cripple for two years: feet tender and swollen. He had been treated by electricity, hot air, massage, bandages, arches and salicylates. *X*-ray examination showed, in both feet, many bony projections from the inferior and posterior surfaces of the os calcis. Operation confirmed the diagnosis, but failed to entirely relieve the trouble, as a second examination showed considerable roughness still present.

CASE 4.—A young man of 25. He has suffered for two years with painful heels. *X*-ray shows bony projections from inferior and posterior surfaces of os calcis. Operation refused, so the diagnosis remains unconfirmed.

In none of the four cases is there anything in the past history to suggest a cause, unless it is the history of activity. There was no history of disease of any kind nor any sign of exostoses in other parts of the body. The only suggestion as to etiology seems to be a possibility of strain or irritation at the points of muscular attachment.

Dr. John A. Koch read a paper on "Elegant Proprietary and Pharmaceutical Preparations."

Adjourned.

GEO. E. ROSENTHAL, *Secretary.*

BI-COUNTY (IROQUOIS-FORD) MEDICAL SOCIETY.

The Bi-County (Iroquois-Ford) Medical Society held its third annual meeting at Watseka., Ill., Tuesday, Dec. 4, 1906. The event was inaugurated by a social dinner at the Iroquois House, at which the local members of the fraternity played the part of hosts and provided for the physical entertainment of the visitors to the best of their ability. All then repaired to the supervisors' room at the

Court House, where the meeting was called to order by President D. W. Miller, M.D., at 2 p. m. The minutes of the last meeting were then read by the secretary. His report for the year 1906, up to, but not including December 4, was accepted and approved as read.

A communication from Dr. Carl E. Black, Chairman of the Council, inquiring if the members were pleased with THE JOURNAL, and inviting criticisms and suggestions as to its management was next read and discussed. It was thereupon moved by Dr. S. D. Culbertson, seconded by Dr. S. S. Fuller, and unanimously carried, that the Secretary be instructed to acknowledge the receipt of Dr. Black's courteous communication and inquire if, in the future, selected papers, read by members at meetings of this society, would, upon request, be published in THE JOURNAL.

Election of officers was next in order, and Drs. Horace Gibson and S. S. Fuller were appointed tellers. The results were as follows: President: Dr. S. D. Culbertson of Piper City; Vice-President, Dr. T. N. Boue, of Loda; Secretary, Dr. Robert Lumley, of Watseka (re-elected); Treasurer, Dr. Horace Gibson, of Sheldon (re-elected). Censors for three, two and one years, respectively, Drs. D. W. Miller, of Gilman; S. S. Fuller, of Paxton; and J. E. Bundy, of Iroquois. The following applicants were elected to membership: Dr. George W. Ross, of Watseka; Dr. J. C. Bucher, of Piper City; Dr. H. C. Henderson, of Milford; and Dr. J. A. Bundy, of Iroquois.

The papers of the meeting were presented as follows: (1) Traumatism of the Central Nervous System, by Dr. S. D. Culbertson; (2), Multiple Neuritis, by Dr. O. O. Hall, of Milford. Both papers were instructive and interesting, and the discussion was general, spirited and profitable.

Dr. J. L. Shawl, of Onarga, reported a very interesting and somewhat unusual case of hemorrhagic diathesis in the newborn, which brought out a lively discussion in which many participated. Dr. Robert Lumley reported a case of dislocation of the sternal extremity of the clavicle, which had received no attention until two weeks after the accident. A beautifully successful result was secured without cutting-down and wiring, or resorting to any other method likely to leave a scar, which would have been very objectionable to the patient, a young lady. After careful reduction of the dislocation, a dram of alcohol was injected hypodermatically between the articular surfaces of the sternal end of the clavicle and the sternum. A piece of heavy pasteboard was them placed over the point of dislocation and held in place by an ordinary adhesive plaster dressing. In two weeks a dram of alcohol was again injected and the dressing replaced as before. At the end of another fortnight the injection of the alcohol was once more repeated, and, in another two weeks the dressing was finally removed. There was no drooping of the shoulder, no displacement of the sternal end of the clavicle, and no scar.

After one of the most agreeable and profitable meetings in its history, the society then adjourned.

ROBERT LUMLEY, *Secretary.*

COOK COUNTY.

CHICAGO MEDICAL SOCIETY.

Regular meeting held Nov. 7, 1906, with Dr. A. B. Keyes in the chair. Dr. Carl Beck read a paper reporting two cases, (a) Septic Thrombophlebitis; (b), Atresia Ani Vesicalis.

DISCUSSION.

Dr. A. J. Ochsner:—Dr. Beck is to be congratulated on the results obtained in the case of atresia ani, because usually the results in these cases are bad. Either the patient dies after the first operation or after one of the succeeding operations; or, if he survives, the end result may be bad, so that one regrets that the patient did not die. I have never seen quite so good a result as Dr. Beck has obtained in the case before us. I was quite interested a few days ago when Dr. Beck told me

that in two successive cases of thrombo-phlebitis, he had noted this interrupted edema, the edema subsiding, recurring and subsiding. I had seen this condition before, but had not noted the fact of its regularity or irregularity of occurrence. On returning home I inquired of each one of four patients that I have in the hospital now suffering from this condition, and found that in one case there was a distinct intermittence. The patient had a thrombophlebitis of the femoral vein which came on after an injury in the region of the spine of the tibia. The other three cases were infections of the upper extremity, and either the patients did not observe the early edema or it came and remained without any interruption. I have, however, observed this symptom before and from now on I will look for it; but I have not noted any reference to it in the literature, nor could Dr. Beck find any reference. It is a point worthy of notice.

In the treatment of this condition we must remember that in the case of thrombophlebitis in the upper and lower extremities in which the infection originated from a distal infection, the condition advances from a comparatively innocent stage until it may reach the very grave condition which was present in Dr. Beck's case.

These patients make up a very large proportion of all cases suffering from this disease, and it is important to prevent the very serious late conditions described by Dr. Beck, if this is possible. This can be accomplished by securing three conditions by means of our treatment. 1. We must prevent the further accumulation of the infectious material at the point of invasion. 2. We must prevent the progress of this infectious material along the lymph channels and through the veins. 3. We must try to secure what Dr. Beck has secured in these two cases, the change of the lymph current away from the seat of infection in a distal instead of in a proximal direction. The first we accomplish by opening the primary site of the infection. The second we prevent by keeping the affected limb quiet; the third by applying the surgical treatment that was described by Dr. Beck.

Some fifteen years ago I demonstrated to this society that motion in the extremities carried the infectious material proximally. Some three years later my brother observed this condition in a very large number of cases which he observed carefully in the Cook County Hospital, and, since that time, I have had the opportunity of observing this condition in a very large number of cases which we have treated, so that what I have said is based not on theory but on absolute fact.

Take, for example, one of these cases under our care to-day. The patient had two fingers crushed. For two weeks after the amputation his progress was normal; then, suddenly, one of the fingers became swollen, then the other. On the following day, the patient became extremely ill. Drainage was instituted and treatment applied, but the patient's condition became worse. On the third day, the thrombophlebitis had extended to the axilla. The temperature was 103 F.; pulse, 120; the axillary lymph glands were enlarged. The veins were indurated and a broad, red line extended from the hand along the anterior surface of the arm and forearm to the axilla, and the physician in charge began to fear for the patient's life. The patient was probably in the condition in which Dr. Beck's patient was when his axillary glands were removed. When the patient came to the hospital drainage had already been accomplished, but the element of rest of the extremity had not been secured. The patient's hand was being dressed three times a day, and each time that this was done there was applied a certain amount of diagnostic massage, which forced the infectious material up the arm so that, in three days, the patient progressed from a moderate degree to a very severe degree of sepsis. I applied an enormous dressing saturated with alcohol and boric acid, although we now think that water will do as well, so long as rest is secured. The next morning the pulse was 80 and the temperature 99 F. The following morning both were normal and remained so. Of course, if we had continued to massage this extremity two or three times a day, the infectious material would have been forced proximally in such large quantities that a pyemia would have resulted, but with the introduction into the treatment of the principles referred to above, the conditions improved very rapidly, which is the rule in these cases. The same might be true had we removed the axillary glands as was done in Dr. Beck's

case. I would say that what Dr Beck has told us is certainly worthy of our attention.

Drs. E. A. Fischkin and E. C. Seufert reported a Case of Leprosy (See page 25), and Dr. Wm. A. Pusey read a paper on the Frequency of Lepers in the United States and What Shall We Do with Them. (See page 36.)

DISCUSSION.

Dr. Maximilian Herzog:—My stay in the Philippine Islands has given me an opportunity to study some of the phases of leprosy. In Manila there has existed for about two centuries a Catholic hospital, which has always contained a number of lepers. During the time I was in Manila there were always two or three hundred leprous patients there. The American government has now set aside an island, the Island of Culion, on which have been erected a number of buildings, and it is intended to segregate all the lepers there. It is estimated that there are between ten and thirty thousand lepers in the Philippines, and it is claimed by the Filipinos themselves that leprosy is the gift of the Japanese. During the feuds of the tribes, before the establishment of the Togugawa Shogunates, the Japanese sold some of their slaves or prisoners as slaves into the Philippines, and it is also a fact that a Japanese admiral once invaded the Philippines. So that there have indeed been enough occasions for the importation of leprosy into the islands by the Japanese.

Dr. Fischkin believes that his case shows an incubation period of fourteen or sixteen years. I believe that it is a mistake to put the incubation period of leprosy at so long a period because this disease begins very insidiously and may exist for a number of years before it is discovered. It has been said that leprosy probably always begins as a nasal or laryngeal affection. That fact was discovered by Stecker, whose attention was drawn to it by Robert Koch. Stecker was a member of the German plague commission that went to India seven or eight years ago, and he examined the nasal, pharyngeal and laryngeal mucosa in about eighty or ninety cases of leprosy and found the lepra bacillus in the majority of them in smears made from the secretion. I believe myself that the view as to this primary starting point of leprosy is correct. I have myself examined a number of recent cases of leprosy or of suspected cases. In every one of them, where I could find any leprous skin lesion at all, I could also show that the nasal mucus contained lepra bacilli. It seems to me, from my own experience, that Stecker's claim that leprosy begins as a nasal or pharyngeal affection is correct.

As to the bacillus itself, generally most of the bacilli which we see are granular in appearance, and it has been said, I do not remember by whom first, that such bacilli are probably degenerated and dead bacilli, and I believe that that, too, is correct. In order to explain why I think so, I will now refer to some experiments which I made in attempts to cultivate in pure culture the lepra bacillus. From time to time claims have been made that some one had succeeded in cultivating the lepra bacillus. Quite a bit of excitement was created in the east two or three years ago by a major in the Indian medical army service. He claimed not only to have succeeded in cultivating the lepra bacillus, but to have been able to prepare a vaccine or anti-serum, leprolin he called it, which, when injected into lepers, would bring about rapid amelioration and a cure. We used some of this leprolin in Manila and the result was that we had two postmortems from tetanus. Leprolin has now again disappeared after a meteoric career of one or two years. Quite recently a French investigator working in the Pasteur Institute, devised a method by which he claimed he could get pure cultures of the lepra bacillus. I tried the method and found that one can, indeed, get a first generation. The medium to be used is somewhat complicated agar. It is an agar of peculiar composition. This agar is melted and about one-tenth of its bulk of the yellow of an egg is added, the mixture shaken, and allowed to cool. When the medium has solidified one inoculates the tube from a young tubercular leprous lesion, using the deeper layers after removal of the upper strata. After about ten days one sometimes gets a slight growth. I succeeded in obtaining a growth by this method and in it I

found bacilli which stained uniformly, showing that the granular bacilli are probably the old dead ones.

Reference has also been made to-night to attempts to inoculate leprosy into the lower animals. About two years ago a French experimenter claimed that he had produced leprosy in monkeys of a low type. I am sure, from reading his reports, that he had tuberculosis. In view of the fact that animal experiments have proven unsuccessful for a long time, and that Bergh, the predecessor of Hansen in the work on leprosy, inoculated himself and nineteen other persons with leprosy and never produced a case of leprosy, it appears to me that the chance of transplanting the disease easily in the lower animals by inoculation is very small. I have tried such inoculations by a peculiar method, original with me, but also failed to make animals leprous. Specimens of leprous skin, with lots of bacilli in them, were enclosed in a collodion sac and placed in the peritoneal cavity of monkeys and other animals. The sacs were left in the peritoneal cavities for about six weeks. After six weeks the sacs were recovered out of the peritoneal cavities. The piece of leprous skin was removed out of the sac under aseptic precautions, and was next divided into two portions. One was examined to determine whether it still showed numerous lepra bacilli, which it invariably did. The other piece was now implanted under the skin of a new animal of the same species, or was rubbed on the nasal mucosa. The collodion sac method was used, because it gives bacteria a chance to adapt themselves to a certain animal species for which it is not pathogenic, so that it may subsequently become pathogenic. These experiments, however, were negative. I did not succeed in making guinea-pigs, rabbits, or monkeys leprous.

A word about the treatment. I mentioned the celebrated Rost leprolin treatment, which has collapsed entirely, an English commission having reported that there was nothing in the method. Dr. Wilkinson was for a number of years in charge of the leper hospital in Manila, and he became a very enthusiastic advocate of the *x*-ray treatment. He treated a number of cases, and two of his cases died, apparently cured. I made the postmortem examination in these cases and found that the skin lesions had healed. I was unable to find in the cicatrices or in any of the internal organs any lepra bacilli. But we must remember that it is not unusual for the disease to come to a standstill; that the bacilli apparently disappear, and perhaps there are some cases which become cured spontaneously. The great danger with claims concerning all methods of treatment in leprosy is that we must not from a few improved cases draw any far-reaching conclusions.

As to Dr. Pusey's paper, I endorse all he said. Leprosy is not a very dangerously contagious disease. I know men in Manila who have lived among lepers for years without contracting the disease. Of course, once in a while a Caucasian, living among lepers, becomes leprous, but it is also true that in families living together not all of the members become infected. Formerly, it was believed that leprosy was an inherited disease. Now we believe the opposite, and I think there is no case on record of leprosy occurring in a child under five years of age. Intimate intercourse between the leprous and the non-leprous is, of course, dangerous, but I have also seen a case where an American married a Filipino from a good family. She, some time after marriage, showed the signs of leprosy, but the husband had, when I last heard about him, not developed the disease. The leprous woman died during the birth of her first child. The latter did not show any signs of leprosy. I secured the placenta and made many sections, but failed to find any lepra bacilli. However, of course, such a single case proves nothing as to a general rule.

Another thing that has been shown is that leprosy always has a tendency to decrease and finally die out when the hygiene of a country in which the disease has existed becomes better. Leprosy was all over Europe during the middle ages, but it has practically died out there. There is no segregation. Lepers are seen frequently on the streets in Japan, and yet leprosy is decreasing there because the general hygienic conditions are improving. Segregation is, however, called

for where there are many lepers and the disease is apparently spreading. In the moderate zone sporadic cases of persons who can take care of themselves, who are not paupers, do not require stringent segregation.

Dr. David Lieberthal:—I am quite familiar with the conditions in the Baltic provinces of Russia, and I wish to refer to the statement of Bergmann just quoted, that the number of lepers in Riga has considerably increased. Now, this increase is undoubtedly due to an influx of lepers from the neighborhood. Leprosy was endemic in those provinces for at least a hundred years among the poorer classes. Riga is, to a certain degree, the center of this locality and had, up to about twelve years ago, few cases of leprosy. Since then railroads were built throughout this region and Riga became easily accessible. In the eastern part of Prussia, in the city of Mernel and its vicinity, leprosy was unknown about fifteen years ago. Cases have since been observed, and their number has increased. The government erected a home for their segregation. This appearance and increase of the disease was apparently not due to immigration.

I wish to call your attention to a simple and quick method of microscopical diagnosis of tubercular leprosy. If the time is short and the patient objects to an excision, a nodule is surgically cleaned, and pierced with a coarse needle, the blood first appearing is wiped off, the next is caught on a slide and stained with carbol-fuchsin. In the specimen thus prepared are seen groups of very numerous lepra bacilli. This method was described and recommended by Tschernoguroff in 1896, and I had, in 1898, the opportunity to try it and to find it valuable in one of my cases. I agree with all that Dr. Pusey said in regard to the fear and excitement unnecessarily caused by the appearance of a leper in a community.

Dr. Oliver S. Ormsby:—In the paper of Dr. Pusey, mention was made of the rarity of indigenous leprosy in the United States, except in the State of Louisiana, where the disease has long existed. Reference was made to the case exhibited by me before this society about two years ago, a report of which was made later in the *Journal of the American Medical Association*. This case was one of the tubercular type and occurred in a Norwegian, aged 25 years, born in the State of Iowa, and living later in Nebraska. He had never been out of the states mentioned until his trip to Chicago. His case was, therefore, a true indigenous one. I am convinced from the history in this family that the father of this patient as well as one sister succumbed to the same disease. It seems probable that the disease in this family was contracted by the father in Norway and imported by him.

Relative to the period of incubation, a case I had this summer is of interest. The patient, a woman, had lived in this country for about twenty-four years. She came from Norway and lived on a farm in the State of Illinois. About five years ago the first departure from her usual good health occurred and two years later lesions began to appear on the skin. It was, therefore, about nineteen years after her departure from the probable place of infection that the disease became manifest. It may be that the good hygienic surroundings and healthful climate here held the disease in abeyance.

As to the demonstration of the active cause of the disease, I might say that in all of the cases of tubercular leprosy that have been observed in the office of Dr. Hyde and Dr. Montgomery during the past five years, we have been able to demonstrate the bacillus of leprosy in the nasal secretion or from the secretion from ulcers on the palate within a few minutes after the first appearance of the patient in the office. We have also demonstrated them in secretion taken from the nodules, in a manner similar to the method mentioned by Dr. Lieberthal.

Concerning social position, the disease, as seen here, occurs almost entirely in people who are foreign born and in a class of patients that are not high in the social scale. Exceptions occur, however. Recently a case occurred in the practice of Dr. Hyde and Dr. Montgomery in a man of good family, born in New England, well educated, and an engineer by profession, but he had spent some years in Mexico, where he probably contracted the disease. He was a typical tubercular case of severe grade. We have treated two cases with *x*-rays and noted marked improvement in all local lesions treated, but, as yet, no marked general improvement has been observed.

Dr. E. L. McEwen:—I was very much pleased to have Dr. Pusey state that he did not regard leprosy so dangerous to the community. I presume that all medical men understand that fact, but nevertheless the laity remains desperately afraid of leprosy and we have something of a duty to perform in attempting to educate the people not to fear the disease.

Dr. Fischkin, closing the discussion:—Dr. Pusey's paper was timely and full of information. It will serve to instruct the profession and to educate the laity, and will prevent such occurrences as we have read in the newspapers, which are a shame and a disgrace to the American public. The fear of leprosy is an inheritance from the medieval ages. It is surely true that leprosy is not the scourge which it is pictured. It is less dangerous than tuberculosis; less contagious than syphilis. Still, it is contagious, and an element of danger, and society is right to require protection of the medical profession. It is more dangerous in Chicago than in other American cities with less crowded districts and more hygienic conditions. Even sporadic cases are here an element of danger. Chicago has more Norwegians than Bergen and more Rusians than Mitau or any other town in the Baltic provinces where leprosy exists. All these people are living under such conditions as to be susceptible to leprosy, so that one sporadic case in Chicago is really more dangerous than it would be in Boston, because the patient lives among the same people and under the same conditions that he does at home, and for this reason, something ought to be done in Chicago. Each single case offers an insoluble problem to the physician; what shall he do with the patient? He cannot treat him at his office and cannot send him away, because no hospital will accept a leper. The public hospitals, at least the County Hospital, ought to accept these cases, and not only accept them, but treat and cure them, that is, they ought to be equipped with all the facilities for their treatment, for, otherwise, the patients will not go there and will try to hide themselves in the crowded districts, and so will continue to be a danger to the community.

Dr. Seufert, closing the discussion on his part:—As to the method described by Dr. Lieberthal, it will undoubtedly hold good for nine-tenths of the cases, but, at the last International Congress of Dermatology, cases of leprosy were reported in which no bacilli could be found by this method; therefore, I think that in such cases, at least, the procedure would not be of any use whatever. It would be absolutely necessary to examine the nodule microscopically.

Dr. Pusey, closing the discussion:—Replying to Dr. L. H. Montgomery's question, I do not know how many lepers there are in the Sandwich Islands. There are a great many of them, but no inference can be drawn from the spread of leprosy there. As I have said before, the Sandwich Islanders are, apparently, as regards their susceptibility to infection, the guinea-pigs of the human race.

As regards Dr. Herzog's remarks about inoculation of monkeys, I was not referring to the monkey inoculation of several years ago, but to some work of which I saw an abstract in the *Journal of the American Medical Association* a few weeks ago. Remembering, however, the fact which Dr. Herzog has again emphasized, of the failure of inoculation experiments in men, I believe he is right in doubting the possibility of inoculating anthropoid apes.

Meeting of Nov. 14, 1906.

A regular meeting was held Nov. 14, 1906, and in the absence of the President, Dr. F. A. Besley occupied the chair. Dr. Joseph Price of Philadelphia, Pennsylvania, read a paper, by invitation, entitled "The Importance of Specialties in Educational Success." (See page 21.)

On motion of Dr. Fenton B. Turck a rising vote of thanks was extended to Dr. Price for his interesting and instructive paper.

Dr. Fenton B. Turck read a paper entitled "Meat as a Food in Health and Disease." Dr. Ralph W. Webster followed with a paper on "Metabolic Aspects of Overfeeding and Underfeeding." These papers were not discussed. On motion, the society adjourned.

DEMONSTRATION OF THE BLASTOMYCETIC ORGANISM IN SPUTUM.*

ANNA ALBERS.
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CHICAGO.

The sputum of this case was sent to Dr. W. Lumsden, of Clayton, Wis., for examination for tubercle bacillus. Two samples have been received; the first was a morning sputum, which was bloody and of a very tenacious character. The second specimen was a day sputum, which was not tinged with blood and was quite watery. Neither specimen contains tubercle bacilli, but I found the blastomycetic organism in almost pure culture. Expectoration is more profuse in the morning.

Dr. Lumsden forwarded the clinical history as follows: Male, aged 64; nationality, Scandinavian; occupation, farmer; married. Had three children, of which two died several years ago of pneumonia and septicæmia. On further inquiry, the children had small pustules over the entire body.

Subjective Symptoms.—Patient was well and healthy until the beginning of July, when present trouble gradually developed. He complains of pain in chest and abdomen, not severe but annoying, dry sore throat and annoying cough accompanied by dyspnea, continuous loss of strength preventing him from working. Appetite poor.

Objective Symptoms.—Face pale and emaciated. Tongue coated with a thick white fur. Eyes normal, conjunctiva anemic. Skin pale and flabby, with some eruptions scattered over the body, which are a trifle larger than an ordinary pimple. They are slightly raised with an hyperemic area around them. The chest is flat, with marked depression of supraclavicular spaces. The expansion is much below normal. Dr. Lumsden failed to find any pathological physical findings in the lungs. The heart sounds are scarcely audible and the apex beat appears to be most distinct a little to the left and below the nipple. The heart gave the doctor the impression that it was laboring in a sack of fluid. The pulse is weak and irregular. The temperature is normal.

This case is of importance from an etiological standpoint. The question arises whether he acquired this disease from his children, and if so, how? On account of the short time since the arrival of the sputum and clinical history, it has been impossible to get further details regarding the patient and, therefore, this short paper must be considered as a preliminary report.

Dr. Ormsby, of this city, was the first to demonstrate this organism in sputum. As regards the number of cases that may occur in one family, we find an interesting report in the *Annals of Surgery*, November, 1904, in which we find a report of three cases of blastomycosis in one family. The first case was a girl. 17 years of age, who met with a runaway accident. Double infection with bacillus pyocyaneus and blastomycosis followed. The mother developed abscesses, eight months later, in various parts of the body. The brother developed an abscess on the hip, about same time, which also contained a pure culture of the budding form of the organism. The question again arises, how was the disease spread in these cases?

Meeting, Nov. 21, 1906.

A regular meeting was held Nov. 21, 1906, with the President, Dr. George W. Webster, in the chair. Dr. Joseph A. Blake, of New York City, read a paper, by invitation, entitled "The Treatment of Diffuse Suppurative Peritonitis." (See page 9.)

DISCUSSION.

Dr. John B. Murphy:—I have been very much interested and instructed by Dr. Blake's paper. I have been aware of his method of practice, as well as the method

* Read before the Chicago Pathological Society, Nov. 12, 1906.

of practice adopted by his colleagues in New York; and the results which he has obtained are certainly very good and striking. The class of cases included in his paper covers practically all of the varieties of general peritonitis; the term used as diffuse peritonitis means a peritonitis involving a large portion of the abdomen around the point of primary infection, as well as far beyond, with no circumscribed adhesions. It is difficult for us to arrive at a definite standard as to what should be included in the term diffuse or general peritonitis, and statistics for a long time will be hampered by divergencies in this particular. We have this great satisfaction, however, that in the last five years the opinion of the medical profession as to the outcome of a perforative or general suppurative peritonitis has been completely changed. I remember, in a discussion in 1896, in this city, before the American Association of Obstetricians and Gynecologists, it was the agreed opinion of that organization that practically all of the cases of general suppurative peritonitis would perish. During the following five years there was a noticeable change in that opinion, and later, in the last five years, it has come to be the opinion of the profession that when a case of general suppurative peritonitis, perforative, but not of the traumatic or gunshot variety, dies, it has been through some sin of omission or commission. Think of that great change in opinion, based on facts, in such a short period of time! And we are justified in assuming that death is due to some mismanagement, when we have such an array of statistics presented here to-night showing the splendid results obtained by the treatment that has been followed by Dr. Blake and his colleagues. When we take into consideration the number of cases he has reported, mostly from an ambulance service, and many of them must have been seen late, we have a more favorable idea of the possibilities in general suppurative peritonitis. Why do patients with general suppurative peritonitis die? Why should they not all get well? They should all get well. They will practically all get well.

We find very much in the literature recently concerning the types of infection; much attention having been given to this phase of the subject, and great stress has been laid on the fact that certain types of infection will terminate fatally. I believe there are occasionally such malignant types of infection that they will terminate fatally, regardless of treatment; yet, from a practical standpoint, we have the same types of infection in the peritoneum from the alimentary tract now as we have been having for the last twenty-five years. Still, our results have very markedly changed in that a former mortality of 95 per cent. has been reduced to a mortality of less than 5 per cent. And that has not been because the types of infection have changed, but it has been because the time and method of treatment have changed. It must be borne in mind that the range or virulence of infection from the alimentary canal does not change as surface infections do, as the great bulk and variety of virulent micro-organisms are destroyed in the upper digestive tract.

If we had time to go into an analysis of the causes of death from general suppurative peritonitis, we would have to consider the element of peritoneal absorption. If we draw a line across the peritoneum on a level with the umbilicus, we will find that the lower half, the portion extending down into the pelvis, has very little or practically no power of absorption, as long as its endothelial cells are intact; while we take the upper portion of the peritoneum, i. e., the diaphragmatic zone, we will find that here practically all of the primary absorption takes place; this area includes the omentum, which passes down over the surface. These are the two sources of primary absorption, and as soon as infective material is poured into the peritoneal cavity, it is taken up by the upper half of the abdomen and by the omentum; but if we allow that septic material to remain in contact with the peritoneum of the lower half of the abdomen for any length of time, while there are no stomata to absorb it as we formerly believed (which has been demonstrated beyond question), the infective material finally destroys its endothelial cells, denudes and blisters it, and thus produces an absorbing surface. In the lower portion of the peritoneum, the number of subendothelial lymph spaces is small, and there is very little absorption, but, as we advance upward, they increase in number and, proportionately, in absorptive power. When pus blisters the peri-

toneal surface and destroys its gloss, it takes off the endothelial cells, the shingles of protection, so to speak, and, from this blistered surface, absorption goes on rapidly. The element of absorption and the position of the infection are important, as well as the time of infection. When infective material is admitted into the peritoneal cavity, nature commences to set up a means of defense. What are nature's means or lines of defense, and in what way can we aid her? These are the questions that must be asked, in order to establish a definite plan of treatment. We must understand the methods of absorption, what nature is doing, and then see what we can do in addition. Immediately after the ingestion of infective material, if it is the ordinary pus micro-organism, there is an increased secretion, a transudation of fluid, and with that we have two types of lymphocytes, the larger macrophages and smaller microxycytes, and these two seem to be essential for the removal of that infective material. It has been shown by Buxton and Torrey that the larger lymphocytes take up the living micro-organism that they are unable to destroy, but that if the smaller lymphocytes grasped the micro-organism and held it first, the smaller was taken in by the larger lymphocytes and at once destroyed. This means that we have at once instituted in the peritoneal cavity an effort at immunity, which controls it for a limited period of time only. After a short time the lymphocytes become glutted and cease to have this power, and are rendered inert. When the infection has remained for a period of time the defense is formed, a local infiltration of the peritoneum with edema. The local edema and infiltration are defensive here the same as in infection in any other portion of the body. It is nature's means of clogging the lymph spaces and stopping absorption everywhere, and the peritoneum is no exception. You doubtless remember the experiments that have been made, where the staphylococcus albus was injected into a rabbit's peritoneum, and after twenty-four hours injections of the colon bacillus were made and all of the rabbits recovered, as a local immunity, by the infiltration and edema, and hyperleucocytosis had been produced. When the colon bacillus and staphylococcus were injected at the same time, absorption and destruction of the peritoneum took place rapidly and the rabbits all died. I believe these experiments have an important bearing on this subject, as brought out by Dr. Blake's paper, namely, that where we have a circumscribed inflammation in the abdomen, as, for instance, in the appendix, we have always a large quantity of milky intraperitoneal fluid. It was found by Sargent, in his examinations, that this milky fluid contained a large number of staphylococcus albus, which we believe prepares the peritoneum, so that when the appendix ruptures into the peritoneal cavity, some preparation has been made for it by nature; a local immunity has been created, retarding the absorption. But where we have a typhoid perforation to deal with, which occurs in a zone in which the colon bacilli are so numerous, we have no preparation made for these germs; we have no local immunity engendered, and that is why in the latter disease a great fatality occurs, when a sufficient length of time is permitted to elapse before the peritoneal cavity is opened and drained.

Gravity has been decried considerably in peritonitis recently, but it does influence the point of accumulation of the products of infection in the peritoneal cavity, which can be demonstrated in every case of peritonitis, whether it originates from perforation of the duodenum, stomach, or the appendix.

It will be four years the coming February since we began to follow out our present line of treatment in general suppurative peritonitis. In the latter we include only cases of direct perforation of the alimentary canal into the free peritoneal cavity. Cases of circumscribed abscess, with pus in the peritoneal cavity in large quantities, are not called general suppurative peritonitis from perforation, and are not included in the list. If we have an ulcer of the stomach, an ulcer of the duodenum, a typhoid ulcer, or a lesion of the appendix, with direct perforation into the free peritoneal cavity, we consider it a general suppurative peritonitis of the perforative variety, and of that class we have had 38 consecutive cases in three years and nine months, with one death. In these 38 cases, we followed the same line of treatment, namely, that of rapidly opening the peritoneal cavity, closing the opening in the viscus, whichever one it was; removing the appendix,

if it had perforated, relieving tension by drainage, and getting out as quickly as possible; neither manipulating, sponging, nor irrigating the peritoneum.

The element of time in operating is of great importance; the element of manipulation and handling of viscera is of still greater importance, because, in the early stage of peritonitis there is a slight exudate covering the bowel which is protective, but if we scrape off that exudate, take off that endothelium, we have a blistered surface for absorption. After closing the opening, we introduce a tube so as to relieve pressure, carrying out all the details of treatment which I will mention later. All of the thirty-seven patients went on to a good recovery. The cause of death in the one fatal case was double pneumonia, which occurred six days after operation for general suppurative perforative peritonitis. The recoveries of some of the cases were not smooth. We had four cases of ileus. In three of them we operated. We had five cases of secondary abscesses in divers positions in the abdomen which had to be subsequently opened and drained, making considerable complications. Notwithstanding our results I do not wish to be understood as objecting to Dr. Blake's method of flushing and closing the abdomen. For the present, however, and as long as we continue to have such favorable results, I feel that we cannot give up drainage. I feel in this type of infection the same as in types of infection in the cellular tissue, that the element of pressure tension is an enormous one in the necrotizing and absorptive effect of infection. If we have an acute infective osteomyelitis within the lumen of the bone and we merely tap it without taking out the pus, but relieve the pressure, absorption and destruction cease and the pathologic condition immediately improves. A dentist will tell you the same with reference to a tooth that is causing trouble. The tension on pus must be relieved. You all know the significance of this in circumscribed abscesses of the cellular tissue type with phlegmon; you merely open the abscess, you do not wash it out to remove pus. The element of pressure is therefore of great importance; the drainage tube maintains a low pus tension and should be used.

How long does such a tube in the peritoneal cavity drain? I have seen pus coming out of the tube for three or four days after its introduction. But that is not material. In the ordinary cases, the colon bacillus type of infection, as soon as the abscess is opened and drained, or the appendix taken out, or the opening communicating with the lumen of the intestine closed, we have a rapid subsidence of the secretion with or without washing.

We come now to the consideration of why cases of general suppurative peritonitis die? Because the infective material gets into the peritoneal cavity? Not at all, but because the infective material is not let out of the peritoneal cavity within a reasonable length of time, and when, as a medical body, we learn to remove that pus from the peritoneal cavity or relieve its tension within a reasonable time, then we will cease to have mortality from general suppurative peritonitis. When the peritonitis has existed for a time and the patient is exhausted or intoxicated from the overdose of poison that he has taken into his tissues, the same as if he had taken an overdose of some alkaloidal poison, what can we do to counteract the effects of that intoxication? I agree with Dr. Blake that enteroclysis is of the greatest importance. I believe it is more important in tiding these patients over the immediate, apparently fatal, toxic effect of the material that is in the blood than any other one thing; and the quantity of saline solution we can succeed in getting these patients to absorb through this channel is remarkable. They will absorb from twenty to thirty pints in twenty-four hours for three or four days, if it be properly given. For instance, a child, 14 years of age, took thirty pints of saline solution each twenty-four hours for four days and retained every drop of the solution. It eliminates the immediate poisonous effects. Why or how this is accomplished we have no theory. But we have the incontrovertible clinical fact that it does. If the abdomen is opened below, the communication with the intestinal tract is closed and the work is done in a short time without manipulation, as shown by Dr. Blake's results, and without irrigation as shown by mine, the patients will get well, providing the operation is timely.

Dr. A. J. Ochsner:—It is a great pleasure as well as a privilege to have Dr. Blake with us. I have personally observed his work in his clinic and have followed his writings for a number of years. No one who has seen Dr. Blake at work can have any doubt about his surgical judgment. What he has to say on any surgical subject has a great amount of weight and value. It is work of this kind, and work of the kind that Dr. Murphy has just described, that we must look to for advancement and benefit in the treatment of this pathological condition. This does not mean that the advancement we have made in the way of prophylaxis should be abandoned. Although we are now able to relieve the condition in many of these cases, so that the outcome is favorable, this should not prevent us from being quite as insistent in preventing diffuse suppurative peritonitis as before. I believe that the mortality in the future will continue to decrease because of these improvements in the treatment as well as because the necessary steps are taken in a prophylactic way to prevent diffuse peritonitis. In infection of the peritoneal cavity we have, as Dr. Murphy has remarked, precisely the same condition that we have in an infection anywhere in the body, and the same principles must be employed in our treatment..

If we have an infection in one of the extremities, for instance, we see to it, first, that we get rid of the source of the infection; second, we prevent the forcing of infectious material in a proximal direction by placing the part absolutely at rest; and, third, we favor the flow of the lymph away from the body by making incisions and applying large moist dressings.

Precisely the same conditions obtained in peritoneal infections. Every one who has a large experience in these cases knows that in perforative peritonitis, in perforation of the stomach, in perforation from typhoid ulcer, if we operate on the patient at the time when the infection which has already occurred can be removed at a time when the infectious material has not been distributed, or has not been carried in quantities to a great distance from the original point, then a favorable outcome may be looked for. The same patient, twenty-four hours later, when the late effects of the injection have occurred, is likely to die, not from the original infection, but from general sepsis, precisely as he would if he had a pyemia from any other cause, precisely as he would if he had the poison of a tarantula carried through the entire circulation.

The second step that must be accomplished is a change in the current of the lymph away from the other portions of the body that are still prepared to oppose the infection, and that, I believe, can be accomplished most satisfactorily in the way described by Dr. Murphy and Dr. Blake.

In following these directions it is, however, important that they be actually followed. It is an easy matter to change a relatively simple peritonitis into a hopeless one by disregarding the very tersely stated plan described by Dr. Murphy, "Get in quick and get out quicker." It is equally important to follow accurately the manner described for supplying fluid by exceedingly slow, non-irritating rectal injection of warm normal salt solution.

I believe that it is important to prevent the distribution of the infectious material from any given point in the peritoneal cavity by preventing the peristaltic action of the intestines in carrying it to various portions of the cavity by the use of gastric lavage, and by absolutely prohibiting any form of nourishment or cathartics by mouth. It is not necessary for me to speak of this phase of the subject at the present time, because I have spoken of it so often that it has become an old story. But, in my personal experience, that element is an important one in prophylaxis as well as in after treatment after peritoneal drainage has been established.

I have had the histories of my cases of diffuse suppurative peritonitis classified, but I will not speak of them at present, because, in comparing results from treatment, I believe that personal results are of far greater importance than a comparison of the results of one surgeon with those of another. I believe that Dr. Blake's comparison between the results obtained in his early cases and those obtained in his late cases is far more valuable than it would be to compare his results with those of Dr. Murphy, for instance, because all the cases are looked

upon in the same manner. One has the same view of the same class of cases, and in using a certain form of treatment in a series of cases of a given kind, the surgeon of large experience forms a conclusion as to the value of a particular form of treatment in this particular form of disease, and he compares the results both under the former and later methods of treatment; while comparisons between the results of various surgeons cannot have this element of uniformity.

We will have to continue our observations in this work. There are in this country and other countries many men who carry on their observations honestly, as Dr. Blake has done, and ultimately we must come closer and closer to the desired result. However, of one thing we can be certain, that in cases of diffuse peritonitis in which there is a general sepsis, in which there has been a destruction of the protective peritoneal tissues, and in which there is a great surface for the absorption of septic material, without the necessary opposing elements, there will always be the requisite opposing elements, so that each one of these cases would resolve itself into an abscess which, no matter how large it may be, is one of the simples conditions to cure. There is great hope in all cases in which an antitoxin seems to form spontaneously and it is to be hoped that in time we may learn to produce this artificially by proper treatment.

Dr. Arthur Dean Bevan:—I have been very much interested in the presentation of the treatment of diffuse peritonitis, as given by Dr. Blake and by Dr. Murphy, because it has appeared to some of us that they represented two absolutely different principles of treatment. I was impressed, in reading Dr. Blake's work, with the idea that he treated diffuse peritonitis with flushing and without drainage; whereas, Dr. Murphy in his treatment of the disease has secured his results by drainage. I have had a more limited experience than either of these gentlemen in the treatment of general suppurative peritonitis; but, within the last three or four years, we have had in my service possibly eighteen or twenty cases. I have not looked up the statistics, but we have been able to save most of them. Formerly we lost most of them.

In hearing the work that has been presented to-night, and in analyzing many of the cases, I am impressed with one fact, that the important reason of our being able to save more cases of general peritonitis than we used to is that we remove the primary focus of the disease, or, at least, prevent any further leakage. I think the essential point is preventing any further leakage of continued infection of the peritoneum. I am rather inclined to think that the secondary point, which is handled very differently by Dr. Murphy and Dr. Blake, is the removal of the material which is already in the peritoneal cavity. Dr. Murphy introduces a tube and lets it run out; while Dr. Blake washes it out. I do not think there is a very great deal of difference in their results. I think, when we analyze the facts, we will be able to see the reason of our improvement in the treatment of general peritonitis to-day over that of five or ten years ago. Now, in these cases we recognize the condition; we stop the continued leak which produces the infection, and we allow, in either one way or the other, the escape of the noxious material which is already in the peritoneal cavity.

There is one point which has been of a great deal of value to me; I don't know who was the originator of it, namely, how are we going to tell whether we have a case of general peritonitis or not? We operate upon a case of appendicitis and we come down to a gangrenous appendix, with perforation and we find very little fluid about it. How do we know whether we have a general peritonitis or not?

Recently, we have been testing the peritoneum with a glass tube. We take a female catheter and introduce it into the cul-de-sac of Douglas just as we would a pipette, in drawing out some urine. After it is put into the cul-de-sac of Douglas the thumb is put over the opening and the catheter drawn out. Frequently, we will draw out in the ordinary glass catheter five or six ounces of pus in the cavity. If there is a dram in that cul-de-sac the catheter will take it up, and it is very interesting to see how differently pus is located. In the ordinary case, with a moderate amount of fluid, we find pus in the cul-de-sac. With the presence of considerable fluid, you put the catheter across to the other side of the pelvis or

even towards the spleen, and test the general peritoneal cavity in this way; you can pick up pus with the glass pipette also, and can determine whether you have a general peritonitis to deal with or not.

Personally, I have used a scheme which is a combination of the methods presented by Dr. Blake and Dr. Murphy. We have stopped any further leakage, whether it has been from a duodenal ulcer, a gastric ulcer, or a perforated appendix, by treating the lesion with an invagination suture, usually with purse-string suture. We have then tested the general peritoneal cavity, determining whether we have had free pus in the peritoneal cavity or not. We have made a small counter-opening over the bladder, that is, at the lower portion of the abdomen, making about an inch incision, and then putting a large glass tube in the cul-de-sac of Douglas. I have not used the return tube of Dr. Blake. We introduce another glass tube through the lowest part of the appendix incision in an appendicitis case, or, if it has been a duodenal ulcer, through the midline incision, and with a large amount of salt solution, we wash out the free general peritoneal cavity until the water returns clear. Then, we have used drainage, but not tubular drainage. I have been opposed to the use of tubular drainage, possibly without just foundation; but we have used simply gutta percha drains and have been very much satisfied with them. A gutta percha drain is inserted at the lowest point in the appendix wound, after the closure, in one of these cases of general suppurative peritonitis, and another in the cul-de-sac. Usually, the drain in the cul-de-sac never drains. That is a singular thing. As a general proposition, I think in 8 or 9 cases out of 10, there will be no pus come from the cul-de-sac wound. Occasionally, however, the cul-de-sac will drain for days or weeks. We had one case of duodenal perforation in which there was drainage for three weeks before there was complete closure and recovery. The gutta percha drain over the primary focus, if that is the appendix, remains but a few days as a rule.

I think we are all indebted to these gentlemen for this very interesting discussion. Certainly, no more gratifying observations have been made by surgeons in the last ten years than in the great and splendid change that has taken place in the successful treatment of general suppurative peritonitis.

Dr. Daniel N. Eisendrath:—A point has been brought out by Dr. Bevan, which, I believe, deserves some further discussion, and that is this: About a year ago I presented 3 cases of diffuse suppurative peritonitis before this society and was taken to task when I said they were cases of general suppurative peritonitis following perforation of the appendix. The question was raised how could I tell whether these cases were instances of general suppurative peritonitis or not? One gentleman who discussed the subject at that time said that we mean, that, so far as our knowledge which is gained through an incision is concerned, there ought to be pus in every portion of the general paritoneal cavity. A letter written by Dr. Baldwin, of Columbus, recently appeared in the *Journal of the American Medical Association*, discussing this subject and asking Dr. Murphy a question. Dr. Baldwin takes the position that we ought not to call these cases diffuse, septic, or general suppurative peritonitis, unless they involve every portion of the general peritoneal cavity.

I regard that as mere quibbling, and something which will probably hinder progress in this direction in which we have made such wonderful headway in the last five years, as these statistics that have been presented show. I think we ought to adopt a definition somewhat like the one given by Dr. Bevan. When we have a perforation of some hollow viscus, with pus diffused in the peritoneal cavity in the vicinity of that viscus, so far as I can see, we should call it a case of diffuse septic or suppurative peritonitis.

Dr. Blake has called attention to something which I have had occasion to observe in two cases of this variety, and that is, that we have diffuse septic peritonitis without any gross macroscopic perforation of the appendix. That has been my experience in two cases in which there was no question about the quantity of fluid in the peritoneal cavity, and yet, so far as I could see, there was no visible

perforation. In all probability, perforation had taken place through the lymphatics of the appendix.

Another point which has been brought out and which, I think, is well worthy of mention, is the character of the drain. It has been shown by some experimenters in Boston, whose names I do not now recall, that the average time during which the peritoneal cavity will allow of drainage is three days, so that the drains which we insert do not do much good after this length of time, and I believe the drains which we use should be as small as possible and do as little harm as possible.

The reason why we have made so much headway in the treatment of this condition has been due largely to a minimum amount of interference, and probably on account of the fact, which Dr. Murphy brought out, that by the lymphatics we drain toward the point in the pelvis through the Fowler position, giving nature a chance to take care of what pus there is already present in the general peritoneal cavity.

At the Michael Reese Hospital, we have made a modification of the method of applying the Fowler position which, I believe, is well worth speaking about. We have accomplished much better results by the use of a little apparatus which was designed by one of the head nurses, and which secures practically an elevation of the bed at an angle of 45° by means of a little rest which can be adjusted to different angles by means of screws. In that way, we get efficient drainage; the patient does not keep losing his ideal drainage position, and the results are far more satisfactory.

With reference to the treatment of the advanced cases, if we see these patients on the fourth or fifth day, when vomiting is incessant, pulse ranging from 130 to 140, with marked tympanites, they are as well off without as with operation, and, if we can secure localization of the pus, they will probably do as well without as with drainage.

Dr. M. L. Harris:—This subject is so extensive and of such great importance that it will bear a little repetition and further discussion. Peritonitis is serious or dangerous in inverse proportion or ratio to the rapidity and extent with which the peritoneum forms plastic exudate. When we have a case of peritonitis that has started from a local point of infection, and the peritoneum in advance of that infection builds up a barrier of plastic exudate, the patient ought to get well and will. If, however, about this local point of infection no plastic exudate is thrown out or furnished by the peritoneum, that case is, from its inception, one of diffuse peritonitis, potential or in fact; whether half of the peritoneum is involved, one-quarter or three-quarters is absolutely immaterial. It is a potential, diffuse peritonitis from the start, so long as the peritoneum fails to limit it by plastic exudate.

The improved results which we have obtained by our modern methods of treating these cases of diffuse peritonitis are due to getting rid of the infection and preventing its extension. We do this by quickly opening the peritoneal cavity, thus relieving one of the elements which produces the extension of the infection, namely, tension, just the same as we do when we relieve the tension in any abscess.

Some years ago, I made a number of experiments on the absorbability of the peritoneum by putting into it salt solution of varying concentrations, putting in a definite amount, allowing it to remain a definite length of time, and then removing the fluid to see how much I could recover. When the fluid was hypotonic, it was absorbed very rapidly, and when it was of low enough concentration, after a definite length of time I found that the fluid had almost entirely disappeared. As the concentration arose, we would get back an increasing amount of the fluid that was put in, until I could get out more fluid than I put in. The experiments showed that the peritoneum would rapidly absorb hypotonic fluids, but fluid passed in the opposite direction when we injected hypertonic fluid.

Dr. Blake has said that he drains in order to remove what cannot be absorbed. I do not think he will stand by that statement entirely, because another object in draining is to drain what would be toxic, if absorbed. One should drain the

peritoneal cavity because if the infectious material is absorbed it might kill the patient. I would add then to Dr. Blake's statement that we drain not only for the purpose of removing what would not be absorbed, but also to remove what would be toxic should it be absorbed.

The two elements which contribute most to our modern success in treating peritonitis are a quick operation, with removal or repair of the point of infection, the little time occupied in getting out the fluid, relieving tension, putting the patient in a position where the fluid that is not let out immedately will run down into that portion of the peritoneum where it is removed by means of a tube with the least possible absorption.

Dr. D. W. Graham:—I am afraid to say much on this subject lest I say too much. The paper and discussion on it have been very interesting to me; but I do not think I can get such results, for instance, as Dr. Murphy reports, namely, 37 recoveries out of 38 cases of diffuse suppurative peritonitis, whatever the cause.

I must take issue with Dr. Murphy when he says that the type of inflammation makes no difference, because I think we must take into account the virulence of the inflammation in making a prognosis and in getting results. whether the inflammation be in the abdomen or in any other part of the body. We have, for instance, a virulent type of inflammation in the skin. We have the mildest type of inflammation in the skin. We have the same degrees of difference in the peritoneal cavity. We have virulent and mild infections of the peritoneum. The mild infections of the peritoneum, if they are properly treated, or even if they are moderately treated, will give us good results nearly every time; whereas the virulent infections, in the majority of cases, will lead to a fatal termination.

Now, I do not want to find fault with Dr. Murphy's statistics; but we know that the Doctor is given to hyperbole at times. I would like to have him tell us why he was so lucky in getting 37 recoveries out of 38 cases of diffuse suppurative peritonitis. What did you do, Doctor, with the others? A surgeon who is doing a general surgical practice, seeing cases in hospitals and in private practice, certainly gets cases that are in a very bad condition when he first sees them. Does Dr. Murphy count those cases? Does he refuse to operate on that class? That is the impression that is going to go out unless he tells us distinctly the class of cases he has treated. I do not think it ought to go out from this society, without some qualifications, that any man can treat 38 cases of diffuse suppurative peritonitis and have 37 of them get well. I must speak plainly, because there are two ways of accounting for such results, and that is the Doctor either declined to operate on some of the bad cases and did not count those, or else he has a definition of diffuse suppurative peritonitis which differs from that of most surgeons; or else, third, he has been exceedingly fortunate in getting 38 cases of the mild type of general diffuse peritonitis—one of the three things.

Dr. John B. Murphy:—I am very pleased to have the opportunity to answer my colleague, Dr. Graham. He is one of the class of objectors we have had in this society ever since I was permitted to join. I had exactly this same experience in 1889, when I reported my first 8 cases of appendicitis. At that time a member could not believe there were 8 cases of appendicitis in Cook County. It is always thus where progress is concerned, and this is no exception to the rule.

I am fortunately in the comfortable position of having no private practice; every one of my cases are in the hospital where the records are open for inspection. I see Dr. Courtwright present, who is a regular attendant at my clinics, and of those 38 cases he probably saw at least 27 or 28. I have defined in a clean-cut way what I include in diffuse suppurative peritonitis. They were cases of general suppurative, perforative peritonitis, meaning that there were no circumscribing adhesions. There can be no question as to my definition or position in this matter. These cases all occurred in hospitals, not one of them in private practice. I have numbered them as they occurred, and reported them. I have told the doctors, who were considerate enough to come to my clinics, that they could see these cases as they progressed. Did I exclude any cases that came to

me with general suppurative peritonitis, or did I refuse to operate on any cases? No, sir. Was it good luck that contributed to my results? No! Good luck has no place in scientific work. It was clean, scientific surgery, based on an accurate knowledge of the pathology and the conditions of absorption, and I reaped the reward that every surgeon will receive who follows that line of treatment in this class of cases without any assistance from the element of luck.

Dr. Blake (closing the discussion):—The question has been raised as to how we are going to tell the extent of the peritonitis. I do not think that it makes such a great difference. Of course, we can have a large exudate with a low grade of inflammation. On the other hand, in some of our worst cases of peritonitis, called by others cases of peritoneal sepsis, there is scarcely any exudate at all. They present the picture of extreme toxemia and die within a short time, say a few hours or a few days. The way we can judge, as a rule, as to the virulency of the nature of the infection or degree of the inflammation and extent or plastic exudate, is by the picture of sepsis. If these patients enter the hospital with a pulse ranging from 130 to 150; with cyanotic patches over the belly; with local evidences of distention; a weak heart action, and rapid respiration, the respiration being in the neighborhood of 40, they are bad cases to deal with, and there must necessarily be a certain mortality attending them. We cannot save them all. It is just as impossible to save all of these cases as it is to save cases of bad infections of the extremities, and all of you have seen patients go on and die in spite of what we did for them in cases of infection of the extremities, cases of cellulitis, etc.

In regard to pressure being relieved by drainage, may be I was not clear in what I said before in regard to the extent of drainage employed. I put in a drain which goes through the abdominal wall. That relieves pressure; but the drainage is not carried down to the bottom of the pelvis. As to removing the exudate which is accumulating from the Fowler position, probably I did not bring out the Fowler position as clearly as I ought to have done.

We use it at a rather low angle, sufficient to make the patient comfortable, so that what fluid is in the abdomen is absorbed. Inflammations of the pelvis do not give us the picture of rapid sepsis that we have in the upper abdomen. The worst cases of peritoneal sepsis, and the most fatal ones I have observed have not always been cases of diffuse peritonitis, but those with multiple abscesses throughout the peritoneal cavity. They are not cases of diffuse unlimited peritonitis in the sense that there are no adhesions; there are adhesions and pus pockets, so that it is impossible to get at all of them and relieve them. We find one pocket of pus and then another, in fact, several scattered throughout the peritoneal cavity. These are bad cases, and most of them usually terminate fatally.

Dr. Bevan brought up the point of the rapid removal of the cause of infection and the stoppage of the infection. The stoppage of the infection is to my mind very important, and I can relate very sad experiences I have had in regard to that.

We have had in our hospital epidemics of gonorrhea in girls in the children's ward, complicated with gonorrheal peritonitis. I have operated on 8 cases, of which I can report the following results: These patients presented the picture of virulent septic peritonitis; they had all the earmarks of diffuse inflammation throughout the abdomen. They were young girls, so that one hesitated to remove the tubes and render them sterile for life. In about 50 per cent. of the cases, I did not remove the tubes; I put drains in the pelvis; I did not remove the site of infection. In other cases, I removed the tubes and either drained or did not drain, and they all got well, showing that if we have an infection with a continual outpouring of pus, infecting the peritoneum, it is impossible to combat it by any of our modern means of treatment, and we must cut off the source of infection. These cases were an object lesson to me, and I think I have learned more from them than from any other cases in my experience.

In regard to the nature of the drain used, I use a cigarette drain of soft rubber with a bit of gauze, which will act as a capillary drain. As to what I expect to accomplish by the drain, it is mainly to drain the external wound and prevent it from suppurating and consequently giving rise to a weak wound. It allows

of the escape of a certain amount of fluid and relieves pressure, which must be of some advantage.

The only difference practically between our treatment is that we try to get rid of the septic material by washing it out without evisceration and Dr. Murphy drains it out. We must be careful not to injure these patients; if we do they are gone.

Dr. Julius Grinker read a paper on

SUBACUTE COMBINED CORD DEGENERATION WITH CASE REPORTS.

ABSTRACT.

The disease has been frequently described under the following names: Combined system disease, ataxic paraplegia, postero lateral sclerosis, subacute combined sclerosis, subacute ataxic paralysis, combined cord degeneration, combined sclerosis of Lichtheim-Putnam-Dana type, diffuse spinal cord degeneration, subacute combined cord degeneration, but a knowledge of its symptomatology has not yet become common property of the general practitioner.

The principal symptoms can be arranged under (a) sensory symptoms, including ataxia, due to posterior column involvement; (b) motor symptoms, consisting first of weakness and spasticity, and later, of paralysis with flaccidity due to implication of the motor neurones.

The cases as usually seen begin with some impairment of subjection sensation in the lower extremities. There may be tingling or numbness or prickling, or a sensation of heat or of cold in the lower extremities and in the lower portion of the spine. This is soon followed by ataxia, or inability to coördinate the muscles in standing or walking. In the early stages motor power is little if at all affected; there may be nothing more than a tendency to rapid fatigue. The deep reflexes usually show an exaggerated response and the Babinski toe sign can be found in the majority of cases. Girdle sensation and neurogliform attacks are occasionally complained of. Subjective sensory disturbances are sooner or later found in the hands and fingers and even in the tongue at times. After a period varying from one to five years the patient gradually becomes paraplegic, and amaciated, sphincter paralysis develops, the reflexes become abolished and death occurs either from an intercurrent complication or from exhaustion. English authors have divided the disease into three stages: the first stage is characterized by ataxia with *slight* spasticity, the second by *increased* spasticity and the third or terminal stage, by flaccidity with complete paraplegia and cachexia. Anemia is a marked feature in many cases and in some, cachexia of some sort is a prominent feature.

The disease runs its course in from one to five years and usually leads to a fatal issue, but prolonged remissions are possible. In the 13 cases which he reports, 11 were males and 2 females; in 4 of the cases the diagnosis was verified by postmortem examination which showed diffuse degeneration in the posterior columns and lateral tracts of the spinal cord.

The disease is to be differentiated from *tabes* by the absence in the latter disease of symptoms referable to pyramidal tract involvement, such as spasticity, exaggerated reflexes, Babinski sign, and by the presence of symptoms peculiar to that disease which are absent in combined cord degeneration, viz.: Argyll-Robertson pupil, lancinating pains, Westphal sign. *Lateral sclerosis* shows spasticity, exaggerated reflexes, motor weakness, but sensory disturbances are characteristically absent in this disease, while they are never absent in combined cord disease, *Friedreich disease* and *hereditary spastic ataxia* show the familial features and occur in the young, while combined cord degeneration lacks these and occurs after 40. *Spinal syphilis* and *multiple sclerosis* will cause difficulties in differential diagnosis from combined cord degeneration if their lesions happen to be located in the posterior and lateral tracts. In that event the etiology and careful search for the concomitant symptoms from other regions will usually clear up the diagnosis. The therapeutic test with mixed antilactic treatment will occasionally decide the diagnosis.

Under etiology it can be stated that the disease usually occurs in persons over 40 who are debilitated or anemic; according to the observation of some, women are most frequently affected; in our series of cases the males predominate. Most authorities assume a hypothetical toxin as the direct cause of the pathological changes in the spinal cord, but this part of the subject is still shrouded in obscurity.

The treatment is entirely sympathetic, but by husbanding the patient's strength early in the disease, life may be prolonged.

Dr. R. Rembe exhibited a case of cysticercus of the eye. Adjourned.

Meeting Nov. 28, 1906.

A regular metting was held Nov. 28, 1906, with the president, Dr. George W. Webster, in the chair.

Dr. Arthur R. Elliott read a paper entitled "Clinical Observations on Blood Pressure in Arteriosclerosis and Bright's Disease, with Suggestions Regarding the Therapeutic Control of Persistent High Blood Pressure," in which he stated that, after making due allowance for physiologic variations, the normal limits of the blood pressure range was from 105 mm. to 140 mm. of mercury. He reported observations on thirty cases of typical advanced arteriosclerosis. The average age of the patient was 61 years, and the average maximum systolic blood pressure 148 mm. In fourteen cases, (47 per cent.) the blood pressure fell within the normal range. In sixteen cases, (43 per cent.) it was persistently above normal, and, in six of these latter, there was positive hypertension (over 170 mm.), each case displaying evidence of aortic atheroma. The points brought out by his observation in arteriosclerosis were the frequency with which it is not attended by elevation of blood pressure, and the necessity for using the sphygmomanometer in all cases to determine this point, owing to the impossibility of detecting high blood pressure in sclerotic vessels by the unaided finger. The writer called attention to the frequency of chronic nephritis in arteriosclerosis and the necessity for carefully excluding this factor in high tension cases. He referred to the researches of Hasenfeld and Hirsch as to the relative involvement of the abdominal arteries and aorta, in cases with and without tension, and concluded his consideration of arteriosclerosis with the statement that, in any given case of arteriosclerosis, the degree of involvement of the superficial vessels is no criterion of the severity of the vascular disease, and that, in cases marked with high tension, where chronic nephritis can be proved not to exist, arteriosclerosis of the splanchnic area or of the aorta above the diaphragm is to be suspected.

Dr. Elliott also reported blood pressure observations in 60 cases of chronic Bright's disease, as follows: Males, 34; females, 26; average age, 51 years; average weight, 160 pounds; average maximum systolic blood pressure, 190 mm.; maximum recorded in series, 285 mm.; minimum in any case, 110 mm.

The essayist reviewed the investigation somewhat in detail, showing that no constant ratio existed between the height of the blood pressure and the amount of albuminuria; the highest average systolic pressure being observed in cases without albumin in the urine. No definite relationship exists between the amount of urine and the height of the blood pressure, a pressure of 285 mm. coinciding with 1,000 c.c of urine, and, on the other hand, low pressure being observed with a copious polyuria. Attention was directed to the diagnostic value of high pressure reading in nephritis. A pressure of 200 mm. or over should awaken suspicion of nephritis and necessitate the elimination of this factor, beyond doubt before any other diagnosis is accepted. The essayist then proceeded to discuss the management of high pressure cases. He reviewed the pathogenesis of hypertension, pointing out the secondary nature of this symptom and its dependence on systematic toxemia. Reference was made to the greater degree of comfort enjoyed by the nephritic with high tension than by the patient with Bright's disease, who had low tension. Inasmuch as the cardiovascular sequence was a reaction against toxemia, he regarded it as a compensatory and, from the physiologic viewpoint, to some extent, a conservative process. Owing to the liability of hypertension to cause serious and often fatal developments, such

as apoplexy, cardiac failure, etc., it often requires regulation. The basis of all true procedure in this direction lies in reducing toxemia by regulation of the patient's diet, fluid intake, hygiene, etc. The main dependence is to be placed on these measures. Increasing tendency is apparent to administer vasodilators for the reduction of excessive blood pressure. This the essayist takes exception to, and advises the utmost caution in procedure along this line. Reduction by drugs is, occasionally, rendered imperative by serious symptoms, such as angina pectoris, apoplexy prodromes, etc., and, under such conditions, nitrites, etc., may be freely administered for their temporary effects. As a routine procedure for the regulation of hypertension, vasodilators are seldom justifiable, and, when employed, should be very cautiously and slowly introduced, watching meanwhile the pulse rate and subjective comfort of the patient as indications of good effect, rather than the degree of reduction in the blood pressure record. The best results are evidenced by a reduction and steadying of the pulse and by an increase in the bodily comfort of the patient. A marked fall in blood pressure, which is more than temporary, following the institution of vasodilator medication is apt to have an unfavorable significance, as it implies a weak heart. The essayist strongly urges greater care and discrimination in the use of medicinal vasodilators in high tension cases.

DISCUSSION.

Dr. Joseph L. Miller:—This paper of Dr. Elliott's is timely, and it has overthrown many of our old views in regard to the causes and treatment of hypertension. Since the use of the sphygmomanometer, we have been able to demonstrate quite a number of new and interesting facts. First, we have been able to demonstrate that arteriosclerosis is not necessarily associated with an increase in blood pressure. In fact, the majority of cases of marked arteriosclerosis are associated with either a normal or a subnormal blood pressure, and the belief has been expressed that in those cases in which the pressure is high, there is probably arteriosclerosis of the splanchnic vessels. Second, it has been demonstrated that the finger is not a reliable means of determining the degree of blood pressure, especially in those cases where the arteries are very much thickened. It has also been demonstrated that the presence of marked accentuation of the second aortic tone may be associated with a perfectly normal or subnormal blood pressure. Groedel has shown, in a series of 170 cases in which there was arteriosclerosis and accentuation of the second aortic tone, that a relatively small per cent. of them was associated with an increase in the blood pressure. Again, it has been demonstrated to us, in these cases of hypertension, that drugs, such as vasodilators, or vasoconstrictors, do not affect the blood pressure as they do in the normal individual; that large amounts of vasodilators may be given without any effect apparently on blood pressure, and that doses of adrenalin may be administered, which will cause a marked rise of the blood pressure in the normal individual without an appreciable increase in these cases of hypertension.

A question of some interest, since the taking of blood pressure has come into use, is whether, in all these cases of hypertension, we should consider that the patient either has arteriosclerosis of the splanchnic area, or has nephritis. Krehl has recently shown, by careful observations, that, in some cases, we have marked hypertension where there are no urinary findings which would indicate disturbed function of the kidney, where autopsy has shown the kidney, both macroscopically and microscopically, normal; and, furthermore, there was no arteriosclerosis of the splanchnic vessels.

He classifies these cases as idiopathic hypertension. I believe this proves that we may have marked hypertension without either kidney change or involvment of the splanchnic blood vessels.

Attempts to reduce blood pressure in these cases of hypertension has been emphasized by Dr. Elliott as being objectionable. That is something we can not lay too much stress on. Hypertension is simply a symptom. It is evidently a protective measure. When the tension is high the patient is a little incon-

venienced, barring the accidents associated with it, like apoplexy, etc. A large amount of nitroglycerin may be given to these patients without appreciable effect. In a case which we followed closely, the amount of nitroglycerin was increased gradually, until the patient took one-sixth of a grain of the alcoholic solution, without any lowering of pressure. In the same way the use of nitrites in large doses was without effect. Profuse sweating was not followed by any appreciable fall in the blood pressure; yet the same individual, when kept on what Dr. Elliott has called disintoxication, that is, daily sweats and elimination from the bowel and absolute rest, after a period of several months, gradually dropped down from 190, until the blood pressure ranged from 160 to 170.

As to the part played by the splanchnic circulation in regulating blood pressure, in some experiments recently made on dogs, where we wished by some mechanical method of continued hypertension to determine what effect it would have upon the arteries, we attempted to do this by compressing the abdominal aorta. We thought by placing a band about the abdominal aorta and constricting it, we might be able to produce permanent hypertension, and after allowing the animal to live for a certain length of time we could determine the effect on the arteries. We found that the abdominal aorta, below the celiac axis, may be completely compressed without effect on the blood pressure. The moment we passed above the celiac axis, compression of the abdominal aorta would cause a rise in blood pressure of eighty or ninety millimeters of mercury. When we clamped off the hepatic vessels a rise in blood pressure of from 40 to 90 would occur. When we clamped off the mesenteric vessels there was a rise in blood pressure of from 40 to 50. When we clamped vessels above the celiac axis we got the maximum rise in blood pressure, showing that any disturbance of the splanchnic circulation which will interfere with the elasticity of the vessels is a very important factor in changes in the blood pressure.

There is one other point I wish to speak of, and that is the factors which produce hypertension. First, we have increased heart action; second, volume of blood; and, third, the degree of resistance offered. Those are the three factors which regulate the blood pressure. Volume of blood offers very little change; it is practically constant. You may bleed a person quite profusely with no effect on blood pressure, on account of the very rapid taking in of fluid from the adjacent tissues. Changes in resistance are due to loss of elasticity in the arteries, constriction of the arteries, and finally changes in the viscosity of the blood. Attention has been called to this latter point recently. The normal viscosity of the blood is five times that of water. Under certain conditions it may be increased nine or ten times that of water, with a corresponding increase in the blood pressure. If it can be shown in cases of nephritis that we have an increased viscosity of the blood, and inasmuch as it has been demonstrated that especially the citrates, the ammonium, potassium, or sodium salts are able to reduce the viscosity of the blood, we may have here a therapeutic measure of some value.

In conclusion, I wish to emphasize those points which Dr. Elliott brought out, that hypertension is much less dangerous than it would appear; that large amounts of drugs may be administered without any effect on blood pressure; that this hypertension is so firmly established, it is impossible to modify it by any of the ordinary vasodilators.

Dr. Charles E. Paddock:—I feel that I must apologize for allowing my name to appear upon the program, because I really have not given the subject any study. I have, however, been interested in the action of the blood pressure in the pregnant state, and am attempting to collect enough facts to warrant me in making some positive conclusions. So far, I am free to confess, the results are negative. From what we have understood in the past, we might infer that, because of the hypertrophy of the heart, there would naturally be an increase in the blood pressure during pregnancy. Recent investigations, however, seem to prove that there is no hypertrophy of the heart at this time. Mueller, in a recent article, gives statistics which disprove the former belief. From a large number

of postmortem findings, he claims that the heart is neither hypertrophied nor increased in weight; in fact, more liable to be slightly under normal weight.

From statistics which I am able to gather, and from my personal observation with sphygmomanometer, I find that the average blood pressure in a pregnant woman is 124 mm. I also find that there is quite a variation, ranging from 96 mm. to 135 mm. in primipara, and a variation of from 90 mm. to 145 mm. in multipara, being greater in multiparæ than primiparæ. The reverse of this we would naturally expect. The blood pressure remains the same during pregnancy, with little, if any, rise, just before or after labor, but during the labor there is some elevation of it. In those cases suffering from toxemia, I had hoped to learn something definite by the frequent use of the sphygmomanometer, but confess that so far I have failed. In this connection, I wish to report two cases which have recently come under my observation.

CASE 1.—Mrs. C., primipara, pregnancy normal; urine negative, last examination being made twenty-four hours prior to onset of labor. Duration of labor, six hours. Propulsive contractions in second stage intense, so that chloroform was used to control them. Delivery normal and no laceration. Forty-five minutes after delivery, patient complained of intense occipital headache, considerable nervousness and dimness of vision. Blood pressure showed that the mercury stood 238 mm. Catheterized urine showed a large amount of albumin by heat. Immediately put the woman into a sweat, which acted promptly; the headache diminished, the blood pressure dropped to 150, and, after a certain time, the sweating process was stopped. Shortly after, the headaches commenced again, the blood pressure went up, and sweating was again instituted. As soon as this was well established, the blood pressure dropped and the other symptoms diminished. This was continued during the greater part of eight hours, together with other treatments usual in this condition. The urine was found to contain a large amount of albumin, with casts, which gradually diminished in amount and cleared up entirely, within five or six days' time.

CASE 2.—Mrs. A., primipara; normal pregnancy. The examination of the urine had been made frequently. Two days previous to the onset of labor quite a large amount of albumin was present. No casts, and urea practically normal in amount. Considering, however, that this was a pathological and not a physiological condition, the patient was put on a rigid diet, with baths and sweats. Two days following this, the patient then being in the thirty-sixth week of pregnancy, labor commenced, and progressed favorably and normally up to almost the end of the stage; when the head was just about to pass the perineum, she was taken with convulsions. The case was terminated by forceps. The blood pressure, which had been taken before this time and immediately following the convulsion, stood at about 128. This convulsion was followed by two more, one hour apart. Then there was an interval of twenty-four hours before another convulsion occurred, followed in an hour by another one, in the meantime there being no elevation of blood pressure. This patient was slow of recovery and six weeks following the delivery there was still evidence of the nephritis, but with blood pressure radiating from 120 to 130.

Here we have two cases presenting, apparently, identical lesions, which we believe resulted from the same toxin. The one which seemed to suffer the least had the greatest blood pressure. The one which was attacked with convulsions seemed to suffer the most. What conclusions we may draw from this, I am unable to say. Of course, they are only two cases, but, from a clinical experience with the sphygmomanometer, I am of the opinion that it has gained for me no diagnostic value, and that, while I shall continue to use it, hoping that I may find something in it, which will prove to me a warning in the eclamptic cases, I must for the present depend upon the other findings to prove the existence of a toxemia or nephritis.

Dr. Fenton B. Turck:—I can only reiterate what Dr. Miller has said as to the importance of Dr. Elliott's paper, and of the observations showing the utility of attempting this work sometimes. An accurate knowledge of the pathogenesis

of the disease under discussion is our only hope of ever obtaining a rational course of treatment. In order that we may arrive at a distinct understanding, so far as is known to-day of the pathogenesis or etiology of this disease, it will be necessary to see how it corresponds to other well-recognized disorders. For instance, ergotism is known to be due to a fungus which, when taken and carried into the alimentary tract, produces certain disturbances which are well recognized and the pathology of which is well known. We have another disease—pellagra—due to a certain fungus, which, when affecting certain maize, when eaten, produces a disease similar in character to other lesions, showing a general autolysis, a breaking down of the cells throughout the body. If the same fungus attacks another kind of maize, it produces no such effects. It has been said that even Reynaud's disease is a kind of ergotism. So much for our analogous relation between well-recognized causes of diseases, simulating in character the sclerotic types.

A disease which affects the tunica intima or the endothelial layer is not so autolytic. This is explained in Wells' recent work, in which he shows that autolysis does not take place in a general way. The order is, first, the liver; second, kidney; third, convoluted tubules of the kidney; fourth, splanchnic autolysis; fifth, the pancreas; sixth, the endothelial layer of the blood vessel, and, seventh, the musculature. We have autolysis taking place naturally in the middle layer before the endothelial layer is attacked. It is important, if we would make any further advances in the etiology of these diseases, without having recourse to animal experimentation, not to go around in a ring, which we are doing at present, each one having his own idea and personal opinion about it, together with his clinical experience.

There have been a great many experiments made recently with adrenalin with reference to autolysis. We have attempted, in our laboratory, some experiments by feeding animals with the bouillon cultures of colon bacillus and extractives, and have found that, after a certain period of time, autolysis takes place. We know that in certain cases of renal disease, we have ulcers of the duodenum. We find ulcers in various parts of the body which show autolytic processes. So we have found, in our experimental work, ulcers in the duodenum and stomach, and lesions in the liver, kidney and in the blood vessels.

In order to determine to what extent fibrosis occurs, we stopped our experiments before complete destruction had taken place. The first series of experiments was repeated and the blood changes noted. The bacteriolytic and autolytic power of the blood are ascertained, and the changes in the blood, which were shown to have taken place in animals, were reported by me to the British Medical Association. The feeding of the animals was kept up for a month in some cases and in others for six weeks, after which the animals were killed. We found that where the lesions had been produced in the blood vessels, the kidney, and in the liver, they would be filled up by connective tissue cells, and of various stages. We have the first stage of nutrition to complete cicatrization, and these changes showed how the lesions were apparently produced, some in the heart, although we can not probably apply this scientific experimental work to a therapeutic discussion; still the lesions are so analogous and so in keeping with what we find in the human subject, that I may be pardoned if I can in a measure show some relation between these experiments and the results obtained. This brings us naturally to what to do in the way of treatment. If these animal experiments are of any value to us, then we should first direct our attention towards the prevention of the cause. If we find there are disturbances of the alimentary tract, we should strive immediately to correct the errors.

About two weeks ago, I presented a paper before this Society, in regard to methods of properly feeding this class of cases by removing the extractives from meat, and feeding patients with them and obtaining interesting results in certain cases, including cases of arteriosclerosis. In dietetics, then, we should remove from the food that which is injurious. We found that extractives were a good soil for micro-organisms in the intestinal tract. If we used certain media, we would not have secondary results which we have obtained, and then, in our

animals experimented on, we found no lesions in those from which we removed the extractives. In those who were fed the extracts, we found certain lesions.

The next is the possibility of correcting or relieving symptoms by increasing the antibodies in the blood, and this is done by serum treatment. We can increase the antibodies by injections. Autolytic processes take place; but, when we speak of intoxication, we mean the absorption of abnormal products. When we lose our own protection, as we do, we speak of that as an autolytic process. To increase the protection so as to prevent self-destruction of cells in the body, we have recourse to serum treatment. There has been some interesting work accomplished along this line, showing the effect of increasing the antibodies against the autolytic processes.

The last is the general symptomatic treatment of stimulating the antibodies. We have heat stimulation, sitz baths, various forms of heat, which are a symptomatic treatment; but we must always use certain symptomatic treatment, which is of great value in the stimulation of the splanchnic circulation; but, nevertheless, there are disturbances of the splanchnic circulation and we have numerous methods of restoring it, such as colonic lavage, heat, sitz baths, and treatment of that kind. In order to treat these patients rationally, we must have a definite idea of the etiology or pathogenesis of the disease, and apply treatment directly to the original cause or causes of the disease before we can hope to achieve any success in restoration. In the near future, we hope to make considerable advance along the rational treatment of this very complex syndrome of arteriosclerosis.

Dr. Frank X. Walls read a paper entitled "The Digestion of the Proteids of Cow's Milk in Infancy." Dr. Joseph Brennemann read a paper entitled "Nutritional Disturbances in Infancy due to Over-Feeding." These two papers were discussed jointly.

DISCUSSION.

Dr. Frank S. Churchill:—The Society is to be congratulated on having heard two extremely interesting papers on an immensely important subject, although I can not agree with all that has been said. The authors seem to depart very radically from the broad general principle which has governed American pediatricians in the substitute feeding of infants during the last fifteen years, viz., in that infants who are taken off of breast milk should be given a mixture which as closely approximates breast milk as possible. That is common sense. That is all the advocates of the much abused, much maligned percentage system advocate or believe in. All they try to do is to have their mixtures imitate good normal average breast milk as closely as possible. The only difference I can see between what Dr. Walls and Dr. Brennemann advocate, and what Rotch and Holt and the other advocates of the percentage system advocate is that they are inaccurate; whereas Rotch and Holt are accurate. Dr. Brennemann has spoken repeatedly, and so did Dr. Walls, of using diluted milk, saying that they would take small amounts of cream, of milk, or skimmed milk, while Rotch and Holt simply say that they take low percentages of fat, low percentages of proteids, and low percentages of sugar. In the paper of Dr. Holt, from which Dr. Brennemann quoted, read at the 1904 meeting of the American Pediatric Society, wherein he reported cases of excessive fat, he mentioned, specifically, the percentage of fat on which the babies were fed. He did not simply say they received an excessive amount of fat, he mentioned the percentage of fat which the children had been receiving. That is the only difference between the opponents of the percentage method of feeding and the advocates of it. The opponents of the method are really feeding babies percentages of fat, of proteids, and of sugar, only they do not know what percentages they are feeding. The advocates of the percentage method of feeding try to estimate what percentages they are feeding, and if they know the standard of the milk and cream with which they are dealing, they know what percentages of these elements they are feeding.

I am very glad to have heard the subject discussed in this way, along definite lines of proteid indigestion and of fat indigestion. I believe by and by we shall pay more attention to sugar in digestion also.

I read a purely clinical paper two years ago before this Society in which I dwelt upon the importance of studying and trying to find out from which form of indigestion babies suffer; whether from feeding too high a percentage of fat, too high a percentage of proteid, or too high a percentage of sugar or too low a percentage of these elements. In that paper, I spoke of the frequency with which we feed babies too high a percentage of fat. There is no doubt about that, and this has been generally accepted for the last two or three years. We have been in the habit of feeding babies too high a percentage of fat. I saw a striking instance of this not long since in consultation with another physician. It was about a year ago. The baby, fifteen months old, had been taken to the country and fed upon milk obtained from three cows, all of which were Jerseys. The mother added cream to the whole milk, and the baby got a mixture that contained about 7 per cent. of fat. When the baby was brought back to the city that method of feeding was not carried out; that is, so high a percentage of fat was not given but the fat was still in excess. Very soon the natural result followed in this case. The baby had a bad attack of enterocolitis, subsequently developed meningitis, and died, indirectly as the result of having had an excessive amount of fat.

In regard to the occurrence of curds in the milk which Dr. Walls has said he never gets with fat-free milk, I can not agree with him. I have fed babies on fat-free milk and on whey, and have seen curds in the stools. I have never made a careful and extensive examination, both chemically and microscopically, of these curds, and perhaps, therefore, I am not justified in saying that they are fat; but I can not see how a baby fed on whey, which contains practically no fat, can have fat in the bowel movements.

The subject of whey leads me to speak of the reasons for which it is fed. It is one of the natural evolutionary steps in the study of the percentage system. It is an attempt to imitate mother's milk. In the proteids of mother's milk we have a larger percentage of lactalbumin than we do of caseinogen; whereas, in cow's milk the proportions are reversed, the caseinogen being in excess. What we attempt to do in making whey is to eliminate this caseinogen, which is indigestible, and we have left the more digestible element, lactalbumin, which is found in such large amounts in breast milk. After having the baby put upon whey, a greater or less length of time, we add skimmed milk or cream in order to increase the amount of fat which the baby needs, and also to add a certain amount of caseinogen, which it also needs, but which it should not have in excess. In that way we simply try to imitate the proportions of these two important elements found in human breast milk. That is all the advocates of that system try to do when they feed whey. It is a closer step toward imitating good average breast milk.

In the first case reported by Dr. Brennemann, if I understood him correctly, while the baby was gaining in weight and was being fed on breast milk, he switched off from breast milk and very soon the child fell off in weight. I would like to ask upon what formula the baby was put at that point, also the age of the baby? This case shows what we would naturally expect, a falling off in the rate of gain toward the last half of the first year, especially if they are switched off from breast milk to a formula of modified cow's milk. It is very essential that we should study the individual case. Each baby must be considered a law unto itself. Some babies have a greater proteid digestive power than others. Some are thrown down by sugar; others will take large amounts of sugar. Others will take large amounts of fat, while some cases are thrown down by large amounts of fat, and they get along much better with lower percentages of fat.

As to constipation being due to excessive fat, it is a well-recognized condition. It does cause a very marked constipation. The skin eruptions which one sees

as the result of feeding a high percentage of fat are likewise very interesting, and if one follows these high percentages he will see that they occur time and again. He will make an attempt to increase the percentage of fat, thinking the baby needs it, and may get an erythema, an eczema, or some other form of skin lesion. That has been my own experience quite often.

I would like to emphasize what Dr. Brennemann has said about long interval feeding, not only with reference to babies that are fed upon modified cow's milk, but babies that are breast fed. The sooner we get them on longer intervals of feeding, the better it will be. I take breast fed babies and have them fed at three hour intervals as early as possible, breaking up the habit of two hour feeding which one frequently finds when he takes charge of a case.

I think the great trouble that most physicians find in the percentage method of feeding babies is that they do not follow the babies up closely and carefully enough. You must watch them carefully and be prepared at any time to make changes. You should study those changes as carefully as you can to find out what ingredient of the milk the baby is suffering from, and then change that ingredient and adapt it to the capacity of the individual infant with which you are dealing.

Perhaps the most important step made in recent years is the realization that milk is a complex food. When you are dealing with adults and a patient comes to you and says, "Doctor, my food does not agree with me," you are not satisfied with that. You delve into the case and find out whether that man or woman is eating too much meat; whether he is eating too much sweet stuff; whether he is drinking too much whisky. You try to find out in what particular part of his food he is taking too much or too little. It is exactly the same with the advocates of the percentage system of feeding, and it is exactly the same way with Dr. Walls himself. He tries to find out whether a baby is having too little or too much proteid, too much or too little sugar, etc., and he regulates it. Whether he regulates it and says the baby is getting 3½ per cent. of fat, 1½ per cent. of proteid, and 6½ per cent. of sugar, or says it is getting diluted milk or cream perhaps does not make much difference, except that percentage is more accurate, and the more exact we can be the better the results we will get.

Dr. Charles E. Paddock:—I, fortunately, have stopped writing formulæ for baby feeding. I feel that I owe the babies which I have fed by the percentage system in the past few years an apology. It is true, they have done fairly well; most of them are living to tell the tale. I have followed out the percentage system, being aided by our essayists to-night, to a great extent, and I trust, in their enthusiasm, they will not go too far, but strike a happy medium.

There were one or two things in their statements that rather surprised me. One is with reference to the feeding of fats. As Dr. Churchill has said, in the artificial feeding of babies we try to simulate breast feeding as near as possible. We must get the same amount of fat, if possible. We find, sometimes, that when a mother nurses her baby at the breast it does not grow. It becomes constipated. There is some fault with the milk, and maybe we find it deficient in fat. That has been the experience of myself and also of Dr. Walls. The other elements were all right, but there was a deficiency in fat. The baby was not gaining. We increased the fat and the baby began to gain in weight. This is a clinical fact, and I do not understand how they can say babies have been overfed. We have followed the percentage feeding method just as carefully as possible, striving to imitate breast feeding. There may be a little difference in the quality of the milk, even though we have the same percentage, but still I think we are going a little too far in what has been said, and I hope that these men will strike a happy medium. It is my intention to assist Drs. Walls and Brennemann all I can to follow this up, and I know that they will feed the babies I will turn over to them regardless of this system which they are now advocating; that is, they will feed babies as they should be fed.

Dr. William J. Butler:—I think we have overlooked one point, for if I am not mistaken Dr. Walls was formerly an ardent supporter of the split proteid and per-

centage feeding, and after this confession of previous scientific sins I think we ought to forgive him. I congratulate him on getting in line with the general tide away from the proteids and toward the fats, as the offending factor in artificial feeding. In other words, he is getting back to where our forefathers stood in feeding children, either with whole milk or skimmed milk as it is, or variously diluted, and I dare say a large part of the artificial fed infants have, during all time, been and will continue to be fed in this way. The percentage feeding, which came into vogue a number of years ago, was considered at once as a solution of the entire question of artificial feeding. It was thought that there was not anything more to accomplish, that everything had been done. It was found, however, that as time went on, this did not fill the bill entirely; there were some infants with digestive apparatuses to which milk mixtures could not be fitted, and, in looking around for a cause proteids were seized upon as the constituent at fault, and consequently various methods were advised to overcome this by reducing the proteids to the lowest possible point in some instances, by making the milk mixture with cereals, lime water, etc. But after all, it was found it did not suit perfectly, and consequently within the last few years, I believe in this country, an alarm was sounded by Holt. Attention was called to the excessive fats as an important factor in the gastrointestinal disturbances of artificially fed children. This with some comparative analysis of butter fats and reports of acidosis from so-called high fat percentages has caused a complete diversion of attention from proteids to fats. Proteids are entirely forgotten in this whole question. In the meantime, Poynton, of London, tells us that we can overcome all the difficulties in infant feeding by adding citrate of sodium to the milk, and he makes no mention of the fats in this method of feeding. The food is diluted with water at first, and subsequently whole milk with citrate of sodium is employed. The fact of the matter is, in feeding infants there are one or two things to keep in mind, namely, that artificially fed infants must be divided into two or three classes. First, we have healthy infants with a healthy digestive apparatus, but who for some reason or other are deprived of mother's breast milk, and must be fed by some artificial means. Second, we have the pathological class, which are subject to other divisions, a class in which we have infants with various nutritional disturbances and a feeble digestive apparatus. Another class of infants that have been referred to this evening are those with acute gastrointestinal diseases of the catarrhal and ulcerative type. These infants are to be fed along entirely different lines. Take a healthy infant, with good digestive apparatus, and anyone who has a clear understanding of the general principles of feeding, and uses judgment, will have no trouble in feeding it.

So far as the pathological class is concerned, children with rickets, malnutrition, etc., that have functional disorders of the gastrointestinal tract, and, in some cases, organic disorders, cannot be treated in the same way, but must be treated on entirely different lines, and, up to date, apparently, the percentage method offers one of the best working principles in dealing with them. I do not think it is so, that these infants have been excessively fed on fats, and I think a wrong impression is going out that a frequent cause of their intestinal and constitutional disturbances are due to too high percentage of fat. It is not customary to feed them more than 2½ per cent. of fat, seldom over 3 per cent., and not infrequently as low as 2 per cent. The percentage basis is an intelligible plan for feeding infants. In the majority of cases, with a little patience, an infant can be accommodated to a suitable diet. Of course, some infants will not only not tolerate milk mixtures or a skimmed milk diet, but will not tolerate any diet. Those infants are going to succumb. But I believe the plan of Poynton is worthy of trial. Where we find difficulty in adjusting a diet on a percentage basis add citrate of sodium to it. I have seen happy results follow that course. I have seen instances in which the addition of citrate of sodium has rendered it possible to feed milk mixtures that had previously not been tolerated. The suggestions as to skimmed milk must be considered a step backward, but it will undoubtedly continue to be used (and to advantage in some cases) as it has been in the past.

While I do not think the addition of citrate of soda to milk will solve the question of infant feeding entirely, I believe it will prove a valuable recourse in infant feeding.

Dr. Thomas Grant Allen:—We are to be congratulated on having these two excellent papers. It is encouraging to some of us to know that long and careful experiments have been carried out to strengthen us in our belief that proteids are not the sole cause of the difficulty in the digestion of cow's milk by the infant, perhaps not even the chief cause. It has been recognized that fats often are the principal cause of trouble. Infants' stools contain a considerable amount of fat, even when the percentage of fat in the milk fed is not high, and a surprisingly large amount when the food contains a high per cent. of fat. These facts show that we ought to begin with low fats and increase only as fast as the baby is digesting the amount we give.

I thoroughly agree with the essayists that proteid is not so difficult of digestion as is generally supposed, and I also agree with Dr. Walls that on account of this belief the baby under 3 months, yes, under 6 months, does not get enough proteid. I am not convinced, however, either by my own work or by the observations related here that milk containing 4 per cent. proteid can be fed to a little baby with impunity. Even if it could be without immediate bad effects I do not think it should be except temporarily, for the after effects must necessarily be bad unless the baby has greater vitality than we have good sense.

I believe we can not afford to discard percentage feeding. Regulating the amount of food to be given a baby by a consideration of the quantity of energy this food will produce does not seem to me to upset anything that we have of real value in percentage feeding. I should characterize it not as a revolution, but as an evolution. We are going to retain all that is good in percentage feeding, and in addition, use the energy test and other tests which I can merely suggest to-night to serve as checks in estimating the efficiency of our methods of feeding.

I want to make two or three criticisms. First, if we imagine that we can regulate feeding by a consideration of the energy alone, instead of by following some age schedule, then I say that instead of feeding according to age we are substituting feeding according to weight, and that either alone is essentially faulty. I have always maintained that we cannot feed a baby according to its age alone or its weight alone. We must have other criteria as well. It goes without saying that the comfort, sleep and digestion of the child must have paramount consideration. In addition we should take account of the increase in weight and the amount of each constituent, in other words the percentages of proteid fat, etc., in the food.

My second criticism is this: In feeding babies milk devoid of fat the amount, with sugar added, needed to furnish the requisite energy, will supply more proteid than is needed, thus overworking the organs engaged in proteid metabolism and resulting in incomplete metabolic products such as uric acid. Suppose, e. g., a baby three months old, weighing, say, 12 pounds, is given sufficient skim milk and sugar to furnish 480 calories (energy equivalent, 40). This would require 30 oz. of skim milk in 24 hours (1 oz. skim milk plus 1-20 oz. sugar furnishing 16 calories). Now, 30 oz. skim milk will furnish between 1 and 1.2 oz. of proteid, which is proportionately three or four times as much as is needed by a man doing moderate muscular work. Further, the sugar in the milk plus the sugar added will furnish 2.7 oz., i. e., the proteid is more than one-third of the total food, whereas in a well-balanced diet the proteid should be only about one-fifth of the total estimated as carbohydrate. In other words, in unduly reducing the fats we must beware lest we run into the opposite fault, that of giving an unbalanced diet in which the proteids are excessive.

My third criticism is directed at the slavish following of an European energy quotient. Perhaps, I have had more experience in testing European and American standards for adults, men and women, and children over 2 years, than any other physician in this country. I have no hesitation in saying that the European standards are inadequate for America. Europeans, men, women and children,

go about their work or their play less energetically than Americans. I believe that the European standard for babies is also too low. At any rate I should not hesitate to run the energy quotient for my babies above 100 calories per kilo., or 45 calories per pound, which is the English equivalent. And I am sure the babies often require 50 or more. In general, however, and particularly when the baby is ill, it is safer to keep the energy quotient below 45 pounds. Here, as in percentage feeding, it is folly to try to feed all babies alike.

For eight years I have used a table, which I worked out in English measures, in checking the amount of proteid and energy. It is easy to use and easy to remember. It may be of service to some here:

	Contains.	Proteid in oz.	Energy in cal.
Skim milk		.04	10
Whole milk	Fat 4 per cent.	.04	20
16 oz. top milk..	Fat 7 per cent.	.04	40
9 oz. top milk..	Fat 12 per cent.	.04	40
Cream	Fat 16 per cent.	.04	50
Cream	Fat 20 per cent.	.04	60

There are many other things in these papers I should like to discuss, but the hour is late. To me these papers have been extremely interesting, and I think, if we are to judge by the large number who have remained till this late hour, they have not proved uninteresting to others. I congratulate Dr. Walls and Dr. Brennermann on having the opportunity to carry out this series of experiments.

Dr. Ernest Lackner:—In discussing infant feeding, our object is to simplify our methods of feeding as much as possible. Heubner has elaborated a system which can be easily used, and he has made an addition to it which is of great value to us all in the treatment of infants. You will find in the last edition of Heubner's work that his treatment is based on age and weight and capacity of stomach. In his division of milk, for instance, the first six weeks, he will give one-third milk. One-third milk can be easily estimated in percentages according to the chemical constituents of milk, so there is no great difference between this method and the percentage treatment. It is still a percentage treatment.

	Proteids.	Fats.	Sugar.	Salts.
1/3 milk equals.....	0.9	1.2	1.5	0.23
2/3 water, 8 % sugar, equals.....	..	..	5.3	...
	0.9	1.2	6.8	0.23
1/2 milk equals	1.5	1.8	2.2	0.35
1/2, 10 % sugar sol. equals	..	..	5.0	...
	1.5	1.8	7.2	0.35
2/3 milk equals	1.8	2.4	3.0	0.47
1/3 12 % sugar sol. equals	..	..	4.0	...
	1.8	2.4	7.0	0.47

In his experiments he has found that we can use a high percentage of sugar. He gives as high as 7 and 9 per cent. of sugar to bring about the heat-producing quality. The percentages given are for children under 1 year, and he also gives a table, graduating the feeding. He asserts that a child should cry forcibly before each feeding. It shows that the stomach is empty or that digestion has taken place. In the second and third six weeks he gives one-half milk. Again, we can estimate by one-half the various percentages of milk. This percentage feeding is not much out of the way except there is a deficiency in fats, and he overcomes that by increasing the percentage of sugar. In the sixth or seventh month he gives what he calls two-thirds milk. By increasing the milk we decrease the amount of water. By mathematical calculation he gives the percentage of sugar we add, to make seven or eight per cent. of sugar. If a child has gained fifteen or sixteen pounds in weight, has a good healthy digestive apparatus, and its bowels are acting well, he puts it on whole milk. He may take two-thirds milk and one-third water, giving a certain proportion, and beyond that proportion he does not go. If a child cries and the quantity given does not satisfy it, he probably will add barley water or oatmeal, something to increase the amount. But he does not decrease the milk proportion, that is, the real food proportion. He simply

increases the volume by adding barley water or oatmeal. Heubner puts the whole subject of infant feeding on a scientific basis. The amounts are stated. Of course, one child will not take what another takes; one will require much more than the other. For these variations in children he has tables that are well-worked out.

I have had considerable experience at the Michael Reese Hospital in dealing with children who were suffering from various diseases, marasmus, etc., and have been successful. I have had some experience with the over-feeding of infants, where they would cry and be in great distress; yet, by reducing the food they would get along very well.

Another thing: Heubner has come to the conclusion that these excessive diarrheas are in a great measure dependent upon bacterial factors; that many of the disturbances and distresses of the stomach and intestines are due to bacteria, except where we have a crisis, as from over-feeding.

Dr. Walls (closing the discussion on his part):—I wish to thank the society for the manner in which it has received my paper. There were too many points brought up in the discussion to be answered. There is one point, however, that might be spoken of, and that is this: I did not advocate any modified method of feeding infants; nor did Dr. Brennemann advocate caloric feeding. I said something about it; that it should be used, as Dr. Allen has emphasized, as a check, as a precaution against overfeeding. I did say something about percentage feeding, namely, that it fell far short of a scientific method. Dr. Churchill said it was the same thing in feeding adults, and he mentioned cocktails. Now, it does not make a material difference whether a cocktail contains 5 or more per cent. of alcohol, but it does make a good deal of difference how many of them one takes. It is the same with cream and sugar. It does not make much difference what the percentage of fat is, but it is the total quantity the child receives in a day. The percentage system tells you that it is 3 or 2 per cent. fat, but it does not tell you how much of that 2 per cent. fat the child receives in twenty-four hours.

If Dr. Churchill gets curds from whey, or from skimmed milk, I have not had them in my cases. Whey is a variable thing. I have seen whey made milky in appearance that contained fat. Such whey gives rise to curds, and these so-called curds are fatty bodies. I saw a child to-day that was receiving cream, 6 ounces; water, 20 ounces; milk-sugar, 2 ounces; and lime water, 1½ ounces, according to the percentage idea. It was not a bad food. It was about 3 per cent. of fat, less than 1 per cent. proteid, and about 8 per cent. of sugar. The child weighed seven and a fraction pounds, or three and a half kilos. The energy of that food is 564 calories, or energy-quotient of 160. It would make no difference to me what percentage of fat is given; but if I go to see a child that is getting 160 calories, and is underfed apparently, I know that child is going to have gastrointestinal disturbance. It has too much food. That is what Dr. Brennemann meant when he spoke of the caloric aspect of feeding as a check against overfeeding.

No objection was taken to the percentage method of feeding, but, as commonly taught, the percentage method is inaccurate. The percentage method does not imitate the natural method, only imperfectly. The percentage method aims at arriving at a food as much like mother's food as possible, which is about four to six, but invariably in all schedules published the amount, four to six, greatly excedes the amount obtained at the mother's breast.

Dr. Brennemann (closing the discussion):—A discussion of the percentage method naturally follows the two papers that have just been read, although our objections to that method have been implied rather than expressed. The hour is so late that this subject can only be further touched upon in one or two phases. I received this morning the November number of the Archives of Pediatrics which contains an article by Holt, from which I will quote a few passages. These contain in themselves a strong argument against the general use of the percentage method as well as an increasing acknowledgement of the fact that

fat is a greater factor in nutritive disturbances than has been generally recognized in this country.

He says: "At a meeting of the society held two years ago I presented a paper setting forth disturbances of digestion resulting from high percentages of fat in the food of infants. My experience since that time has shown that these disturbances are of great frequency and, I think, are increasing in the hands of the general profession who are practicing infant feeding."

"I see more failures in the use of modified milk from ignoring the rules regarding the proportion of fat than from any other single cause."

"I have learned never to accept the simple statement of a nurse or a doctor regarding the percentages a child is taking, for I seldom find that it is even approximately right."

"The mistakes in calculation which men are making are not in tenths of a per cent., but often of 3 or 4 per cent."

"We can not expect to do very much in teaching details to men in busy practice; few of them have either the time, the disposition or the patience to master even the few essential principles of percentage feeding. . . . Our chief hope for the future is with the students of medicine."

"One of the first causes of trouble, I think, is the great number of complicated methods of calculating percentages which have been published."

He then gives a method of "reducing any milk formula to approximate percentages," and another eminent pediatrician present gave still another method for calculating percentages!

Dr. Churchill has said that Holt in his former paper, quoted in mine, gave exact percentages of the fats that caused the symptoms that he details and that these were very high—from 5 to 7 per cent. I am gland that point was mentioned. It makes my point all the stronger, that it is the amount of fat and not the percentage that causes the trouble—because, I think, we have demonstrated, over and over again, that the identical symptoms-complex is produced by feeding too much milk, even if that milk contains only 1½ per cent. fat (see Baby E), or 2.9 per cent. fat in a child 19 months old (see Baby McGuire). The same symptoms are produced regardless of percentages.

Dr. Churchill and Dr. Paddock have both made the statement that one thing in favor of the percentage method was that we could imitate mother's milk in composition. The difficulty that we all have in feeding babies other food than its natural food, while the chemical composition, so far as we know, can be made very similar, alone answers this point. We do not attempt to imitate mother's milk, chemically, beyond a certain point. We do try to imitate it physiologically, i. e., to get it do the same thing for the baby that mother's milk will.

Dr. Paddock also stated that the babies that he had seen fed were apparently not overfed—that the milk was not richer in fat than mother's milk. I am afraid that, on account of having to hurry through with my paper, I did not convey clearly the idea I wished to. It is not a question of strength of milk, or of percentage—it is a question of quantity. The cow's milk may be one-half weaker in fat than mother's milk and yet the child may take three times as much.

If Dr. Paddock thinks he has not been guilty of overfeeding I would ask him to do as we have done; go over his past records, especially of those babies that did not do as well as they should have done. If he will consider both the symptoms in some of these cases and the amount of food from a calorimetric standpoint that these children received, I believe he will find some things that will be interesting. We did not realize at the time we were doing it that we were overfeeding.

Dr. Churchill says that the only difference between our method and the percentage method is that the latter is accurate, while ours is not, as evidenced by the fact that I have made such statements as "we added a little more milk," etc. Outside of the fact that the greater part of my paper implies that the percentage method is not accurate because founded on an erroneous idea, and also because it not only permits, but favors, excessive amounts of food—outside of this I would only state that we have recommended no method here to-night. The two papers have been essentially destructive. The time did not permit us to go into

the constructive side, so that our method is only inferred and we ought not to be held responsible for some one's interpretation of the probable nature of that method. The determination of energy quotient is not a method of infant feeding—it is intended as a check on overfeeding and underfeeding—and if it is ever indicated it is in making the percentage method more accurate.

In conclusion I would say that not one ever fed babies more zealously by the percentage method than we did. We feel that we have gotten a new light, and we believe we are on firmer and safer ground than we were.

LAWRENCE COUNTY.

The Lawrence County Medical Society held its annual meeting on Monday, Dec. 3, 1906. Dr. J. F. Schrader, of Bridgeport, read a paper on Nephritis, and Dr. Charles P. Gore read one on The Anatomy and General Evidences of Intestinal Diseases. Great interest was shown in the discussion that followed the reading of the two papers. The following officers were elected for the year: Dr. R. R. Trueblood, President; Dr. Chas. P. Gore, Secretary and Treasurer; Dr. J. A. Emmons, Censor. At 6 o'clock a magnificent banquet was served to the society by the ladies of the Christian Church, at the home of Dr. R. R. Trueblood. This meeting was the best attended and the most enthusiastic meeting the society has ever held, and promises success for the future of Lawrence County Medical Society.

CHAS. P. GORE, *Secretary.*

PIATT COUNTY.

Secretary B. L. Barker, of White Heath, reports that the Piatt County Medical Society is active and holding regular meetings. At a recent meeting, the life insurance question was taken up and a resolution binding every physician in the county to the $5.00 fee was passed and has been already signed by most of the practitioners in the county. A new fee bill went into effect December 1, raising the fee from 20 to 50 per cent. for all work and making fees uniform throughout the county. The people are not opposing this, since they seem to realize that increased fees are necessary to make increased expenses in the practice of medicine. The Secretary states that adjoining counties will also take this matter up and hopes that the movement will become general.

On October 31, the Society gave a banquet at Monticello, to which every member of the profession in the county was invited. A large number attended. Drs. W. K. Newcomb and A. S. Wall, of Champaign, and Dr. A. F. Wilhelmy, of Decatur, were present. Dr. W. F. Matson, the President, acted as toastmaster and a number of good speeches were made, tending to the betterment of the profession.

The Society is now in its third year and on the best footing it has ever been and is doing a noble work for the profession.

VERMILION COUNTY.

The annual meeting and election of officers of the Vermilion County Medical Society was held in the City Hall, December 10, 1906. The minutes of the November meeting were adopted. The following physicians were elected to membership: A. J. Clay, Hoopeston; O. W. Allison, and J. W. Turner, Catlin; J. M. Hickman, Westville; J. M. James, Henning; H. L. Dice and D. C. Hinshaw, Ridgefarm; E. F. Nebeker, L. V. Fairhall and W. R. Tennery, Danville.

The treasurer's report was read and accepted. The election of officers resulted as follows: President, A. J. Leitzbach, Fairmount; vice-president, C. E. Wilkinson, Danville; secretary-treasurer, R. E. Clark, Danville.

The special feature of the meeting was a social session, with smoker and buffet lunch.

E. E. CLARK, Secretary.

NEWS OF THE STATE.

Diphtheria is reported to be increasing in Metamora.

Dr. L. W. Fulton, Sr., has removed from Loami to New Berlin.

Dr. L. W. Fulton, Jr., has removed from Loami to Old Berlin.

The epidemic of scarlet fever at Moline is reported to be abating.

It is reported that the scarlet-fever situation in Tuscola is improving.

Dr. C. C. Allen of Virden has resigned as surgeon of the C. & A. R. R.

Dr. Henry B. Favill has been elected president of the Municipal Voters' League.

Dr. Joseph Zeisler of Chicago, has returned from Europe much improved in health.

Dr. William L. Baum has been recently elected commodore of the Chicago Yacht Club.

Dr. Frank M. Hagans, Lincoln, has been recently appointed physician of Logan County.

Dr. W. W. Van Wormer of Girard has been appointed local surgeon of the C. & A. Railroad.

The Burton Holmes lecture in Chicago, Dec. 3, 1906, netted about $9,000 for the Provident Hospital.

Dr. A. E. Halstead has been recently elected professor of surgery in the Northwestern University Medical School.

Dr. Nicholas Senn of Chicago was recommissioned Surgeon-General of Illinois by Governor Deneen, Dec. 31, 1906.

Dr. George Paul Marquis has been appointed a member of the County Hospital staff, vice Dr. Horace M. Starkey, retired.

Dr. Albert E. Brown has not removed to South Dakota, as stated in the December JOURNAL. He is in Waukegan to stay.

The address of Senator Tilman in Chicago is reported to have netted $2,000 for the benefit of the Chicago Union Hospital.

Dr. Everett J. Brown, of Decatur, has purchased a farm of 160 acres in Christian County, Illinois, for which he has paid $24,000.

Schools have been closed and church services and other public meetings have been interdicted in Colfax on account of cases of diphtheria.

The Oak Park Hospital expects to be opened about the first of February. Dr. John W. Tope has been chosen to organize its medical staff.

The prevalence of smallpox in Galesburg has necessitated the requirement no child shall attend school unless it has been properly vaccinated.

Dr. Robert H. Babcock of Chicago has been appointed a member of the consulting staff of the County Hospital, vice Dr. Fernand Henrotin, deceased.

Dr. B. C. Corbus has severed his association with Dr. Louis E. Schmidt and has opened offices at 407 Schiller Building, 103 East Randolph street.

Dr. Charles J. Whalen, health commissioner of Chicago, spoke before the Steel Club, Joliet, Nov. 16, 1906, on "The Influence of Sanitation on Mortality."

The Passavant Hospital of Chicago received about $40,000 from the total receipts of the "Streets of Paris," recently given in that city for the hospital's benefit.

Dr. Louis L. McArthur of Chicago has been chosen to represent the Illinois branch of the National Red Cross at the annual convention in Washington, D. C.

Dr. Charles W. Behm of Chicago, chief of the disinfection bureau of the department of health, has been seriously ill with diphtheria, but is reported to be convalescent.

Dr. Finley Ellingwood has severed his connection with the *Chicago Medical Times* and will found a new journal devoted to the exploration of so-called specific medication.

Dr. Alexander Hugh Ferguson of Chicago was decorated with the Order of Christ by the Count de Saint Eulalia, by the Portuguese consul, at New York, at a complimentary dinner, Nov. 27, 1906.

The Ravenswood Hospital, Ravenswood, Chicago, has recently opened its doors to patients. It is a thoroughly fireproof, modern, well-equipped hospital, and is located in one of the cleanest sections of the city.

Dr. Samuel P. Hopkins, of Springfield, will remove to Omaha and enter in partnership with Dr. Albert P. Condor, of that city. Dr. Hopkins will also be connected with the Creighton Medical and Dental College.

Dr. Louise Miller, Moline, was fined $5 and costs, Nov. 22, 1906, for violation of a health ordinance of Moline, which provides that physicians must report cases of contagious diseases within twenty-four hours after their discovery.

Dr. George Thomas Palmer, having severed his connection with the Illinois State Board of Health, will take up the practice of medicine in Springfield and will continue as editor of the *Chicago Clinic and Pure Water Journal.*

At the next session of the Legislature, the Coroner's Association of Illinois expects to enter opposition to the use of embalming fluids containing strychnin and arsenic, as the use of these drugs has, it is claimed, on many occasions, interfered with the determination of the cause of death.

O. B. Weeks, who has been conducting an advertising medical business in Springfield, was recently brought before Police Magistrate Shipp. He pleaded guilty to the charge of practicing without a license and was fined $100. It is alleged that Weeks had never attended a medical school.

Three hundred and eighty-six inquests were held in Cook County during the month of December, 1906. Among these were 14 murders and 34 suicides. Railroads and street cars were responsible for 63. Anesthesia under operation, 2; alcoholism, 21; abortion, 2; burns and scalds, 7.

Dr. Charles J. Whalen, commissioner of health in Chicago, announces that the ambulance service in the police department has been officially turned over to the health department and will be manned by physicians. This makes a good opening for young physicians who wish experience in emergency work.

Dr. William J. Chenoweth, of Decatur, after a practice of more than sixty years, has announced that he will abandon practice January 1, and offers his office and professional outfit for rent. Dr. Chenoweth is 83 years of age, but is able to ride a bicycle from three to fifteen miles each day. He only abandons his practice because of defective hearing.

The Association of the Military Surgeons of the State of Illinois held its semi-annual meeting in Chicago, Dec. 13, 1906. At the morning session Dr. Billings held a clinic at Rush Medical College, following which was a business meeting and the reading of papers. Luncheon was served at the Presbyterian Hospital, and demonstrations were made on the cadaver by Col. Nicholas Senn and others. Dr. Senn entertained the association at dinner at De Jonghe's in the evening.

The Secretary of State at Springfield has licensed the following new corporations: Maywood Union Hospital, capital, $5,000; to operate hospital; incorporators, D. W. Parker, Frank S. Righeint, V. E. Raible, Acme Medical Co., Chicago, capital, $10,000; manufacturers and dealers in medicine. Incorporators, Claude A. Gay, Fred J. Wegg, G. R. Housinger. Fenger Memorial Association, medical research. Incorporators, Frank Billings, Ludvig Hektoen, Karl Deopfner.

MARRIAGES.

FRANK J. FARA, M.D., to Miss Julia M. Tupy, both of Chicago, November 21.

VINTON BOYINGTON, M.D., to Miss Eva Spaulding Price, both of Waukegan, Ill., December 12.

EVERETT H. BROADWAY, M.D., to Miss Arta V. Maginnis, both of Abingdon, Ill., December 12.

CHARLES A. COFFIN, M.D., Kewanee, Ill., to Miss Fannie E. Thorp of Guelph, Ontario, November 21.

WILLIAM HENRY STRATFORD, M.D., Austin, Chicago, to Miss Marguerite Ray, Chicago, November 21.

OTTO W. KNEWITZ, M.D., East St. Louis, Ill., to Miss Elizabeth Wildy, New Athens, Ill., November 3.

JOHN C. MILLER, M.D., Chalfinbridge, Ill., to Miss Cecil Stoey, Pittsburg, Pa., at Columbus, Ohio, November 14.

J. WALTER FAHRNER, M.D., to Miss Grace Huntington, both of Joliet, Ill., at Grand Rapids, Mich., recently.

WILLIAM MICHAEL HARTMAN, M.D., Good Hope, Ill., to Miss C. M. Donaldson, Dayton, Ohio, at Macomb, Ill., December 1.

DEATHS.

JACOB SCHNECK, M.D., died at his home in Mount Carmel, Ill., December 18.

JONAS S. NEWBURGH, M.D., Chicago, was killed by a train in that city, Nov. 10, 1906.

ARTHUR RAMSER, M.D., died at his home in Chicago, November 15, from heart disease.

CORNELIUS HOGAN, M.D., died at his home in Chicago, December 7, after an illness of two weeks.

ERNEST J. MILLER, M.D., died at his home in Sycamore, Ill., November 19, from embolism, aged 52.

FREDERICK L. POND, M.D., died at his home in Chicago, from heart disease, Nov. 23, 1906, aged 71.

GEORGE MONROE EMRICK, M.D., died at his home in Chicago, December 12, from acute nephritis, aged 53.

JOSEPH H. FIRESTONE, M.D., died at his home at Freeport, December 14, from typhoid fever, after a short illness.

CHARLES WILMOT OLESON, M.D., a member of the Chicago Medical Society, died at his home in Lombard, Ill., December 1, aged 66.

WILLIAM HARRISON HIPP, M.D., a member of the Illinois State Board of Health, died from pneumonia at his home in Chicago, December 19, aged 42.

LOUIS C. STRAKEL, M.D., for many years a practitioner in Belleville, Ill., died at his home in Chicago, from endocarditis, after an illness of one year, aged 67.

DR. FERNAND HENROTIN, one of the prominent practitioners of Chicago, died at his home from myocarditis, December 9, after an illness of three weeks, aged 59. He was born in Brussels, Belgium, Sept. 28, 1847, the son of Dr. Joseph F. Henrotin, a well-known practitioner of Chicago from 1847 to 1875. He received his education entirely in Chicago and, after his graduation from high school, entered Rush Medical College, from which he graduated in 1868. From 1868 to 1870 he was prosector at Rush Medical College; surgeon of the police department 15 years,

and for 21 years of the fire department. For several years he was chief surgeon of the First Brigade, Ill. N. G. He served for many years on the medical staff of Cook County Hospital, and was president of the medical board. He was connected with the Chicago Policlinic and served as professor of gynecology, secretary, and, later and until his death, as president of that institution. He was deeply interested in the new Policlinic Hospital, which is now nearing completion. He was senior surgeon at the Alexian Brothers' Hospital and gynecologist at the St. Joseph's and the German hospitals. For many years he was a member of the Illinois State Medical Society, Chicago Gynecological Society, American Gynecological Society, Association of Military Surgeons of the United States, Association of Military Surgeons of the State of Illinois, and in 1896 was president of the Chicago Medical Society. During his term of office, and under his special supervision and management, the reorganization was undertaken which has resulted in more than trebling the membership of the society. For many years he was secretary-general for America of the International Congress of Gynecology and Obstetrics. Dr. Henrotin was a gynecologist of known repute and a bold, yet conservative, operator. He is said to have been the first operator in America to perform vaginal hysterectomy for suppurative pelvic disease. He has written many monographs of importance, most of which are on gynecologic subjects. His chapter on ectopic gestation in "Practice of Obstetrics," by American authors, and his article on gynecology in the International Text-Book on Surgery are especially noteworthy. At the time he was stricken with his last illness he had practically completed the section on vaginal hysterectomy for Kelly and Noble's gynecology. Dr. Henrotin was an ardent advocate of higher standards of medical education and was especially interested in postgraduate work; he published a small brochure about two years ago on "Democracy of Education in Medicine," which set forth his advanced views on this subject.

NEW MEMBERS OF THE AMERICAN MEDICAL ASSOCIATION.

During the month of December the following members of the Illinois State Medical Society became members of the American Medical Association:

Asay, J. E., Rock Island.
Boynton, L. V., Vermont.
Carr, O. N., Verona.
De Roulet, Alfred, Chicago.
Dixon, W. A., Decatur.
Dollear, A. H., Watertown.
Dunn, B. B., Perry.
Evinger, J. W., Paris.
Griffith, B. A., Swan Creek.
Hansen, O. A., Chicago.
Knewitz, O. W., E. St. Louis.
Leach, R. B., Joliet.
Millard, H. A., Minonk.
Napheys, W. D., Jr., Chicago.
O'Brien, C. L., Chicago.
Renwick, J. C., Warren.
Rosenblumm, S. M., Chicago.
Rosenstiel, Mary L., Freeport.
Steely, Geo., Danville.
Stockdale, Frank A., Coal City.
Stolp, Rufus B., Kenilworth.
Tremblay, J. J., Moline.
Vandervort, Franklin C., Bloomington.
Wynekoop, G. H., Chicago.
Young, C. S., Genesee.

NEW MEMBERS OF THE ILLINOIS STATE MEDICAL SOCIETY.

During the month of December the following physicians became members of the Illinois State Medical Society:

COOK COUNTY.
Bishop, Arthur.
Blything, J. D.
Budan, A.
Clark, Chas. C.
Dodge, Wm. L.
Echols, Chester M.
Gieraltowski, Chas P.
Grabow, Paul E.
Haushus, J. Wm.
Hochrein, Geo. W.
Hendricks, H. Porter.
Little, Zack.
Lee, George W.
Lundgren, A. E.
Millelsen, Agnes.
McClintock, R. W.
Metcalf, Walter B.
Mercer, Frederick W.
Nagel, F. E.
Needham, Frank Stewart.
Rohu, W. C.
Roby, Harlow S.
Svebakken, Otto O.
Speed, Kellogg.
Simpson, E. Grant.
Wedelstead, Bismark.
Wynekoop, G. H.

CRAWFORD COUNTY.
Carlisle, J. W., Robinson.
Hardin, Chas. E., Trimble.
Johnson, Robt. S., West York.

CARROLL COUNTY.
Camp, Chas. H., Chadwick.
Gray, Alexander, Savanna.

CLINTON COUNTY.
Bechtold, W. G., Breese.
DuComb, J. W., Beckmyer.
DuComb, M. P., Keyesport.
Fischer, A. L., Hoffman.
Fischer, F., Bartelso.
Klutho, J. C., Breese.
Poos, G. H., Trenton.

DEWITT COUNTY.
Zeiglar, J. H., Farmer City.
Price, H. E., Weldon.
Sanderson, H. S., Waynesville.

DUPAGE COUNTY.
Simpson, E. Grant, Naperville.

HANCOCK COUNTY.
Howard, Florence, Hamilton.

JACKSON COUNTY.
Keesee, John, Carbondale.

LOGAN COUNTY.
Stults, B. F., New Holland.

MONTGOMERY COUNTY.
Driskell, Cecil R., Waggoner.

MONROE COUNTY.
Heidelberg, H., Hecker.
Wilhelmy, August, Mayestown.

MERCER COUNTY.
Boyer, Walter N., Aledo.
Kleinsmid, J. S., Aledo.

PEORIA COUNTY.
Hoit, J. D. C., Elmwood.

PUTNAM COUNTY.
Joynson, Harry B., Granville.
McCormick, G. A., Hennepin.
Simmons, William F., Magnolia.
Weeks, MacCauley, Granville.
Watson, R. L., Florid.

SANGAMON COUNTY.
Kelly, J. W., Springfield.

WINNEBAGO COUNTY.
Penniman, David, Argyle.

MISCELLANEOUS.
Crocker, George L., Twin Falls, Mont.
McCormack, A. M., Bowling Green, Ky.
Pomeroy, E. H., surgeon staff of Tennessee Coal and Iron Co., Monterey, Tenn.

ILLINOIS STATE MEDICAL SOCIETY

SECTION OFFICERS AND COMMITTEES.

SECTION ONE.

C. W. Lillie, E. St. Louis.....Chairman
Ralph W. Webster, 100 State St., Chicago.. .....Secretary

SECTION TWO.

E. H. Ochsner, 710 Sedgwick, St., Chicago. .....Chairman
H. W. Chapman, White Hall.....Secretary

COMMITTEE ON PUBLIC POLICY.

Robert B. Preble, Chairman.
Carl E. Black, Jacksonville.
J. W. Pettit, Ottawa.
The President and Secretary, ex-officio.

COMMITTEE ON MEDICAL LEGISLATION.

L. C. Taylor, Springfield.
M. S. Marcy, Peoria.
J. V. Fowler, Chicago.
The President and Secretary, ex-officio.

COMMITTEE ON MEDICAL EDUCATION.

Frank P. Norbury, Jacksonville.
J. F. Percy, Galesburg.
C. L. Mix, Chicago.

COMMITTEE ON SCIENTIFIC WORK.

The Section Officers.
The President and Secretary.

COUNTY SOCIETIES.

This list is corrected in accordance with the best information obtainable at the date of going to press. County secretaries are requested to notify THE JOURNAL of any changes or errors.

Adams County.
J. M. Grimes, Pres.....Camp Point
George E. Rosenthal, Secy.....Quincy

Alexander County.
Samuel B. Cary, Pres.....Cairo
J. T. Walsh, Secy.....Cairo

Bond County.
John W. Warren, Pres.....Greenville
J. C. Wilson, Secy.....Greenville

Boone County.
R. W. McInnes, Pres.....Belvidere
R. B. Andrews, Secy.....Belvidere

Brown County.
S. J. Wilson, Pres.....Versailles
F. E. McGann, Secy.....Mt. Sterling

Bureau County.
J. C. White, Pres.....Seatonville
O. J. Flint, Secy.....Princeton

Calhoun County.
I. S. Berry, Pres.....Batchtown
Stephen Piatt, Secy.....Hardin

Carroll County.
G. W. Johnson, Pres.....Savanna
H. S. Metcalf, Secy.....Mt. Carroll

Cass County.
C. M. Hubbard, Pres.....Virginia
J. A. McGee, Secy.....Virginia

Champaign County.
C. M. Craig, Pres.....Champaign
C. D. Gulick, Secy.....Urbana

Clark County.
Geo. T. Rowland, Pres.....Martinsville
L. J. Wier, Secy.....Marshall

Clay County.
W. E. Burgett, Pres.....Louisville
C. E. Duncan, Secy.....Flora

Christian County.
M. W. Staples, Pres.....Grove City
D. D. Barr, Secy.....Taylorville

Clinton County.
T. E. Alsop, Pres.....Carlyle
C. H. McMahan, Secy.....Carlyle

Coles County.
N. C. Iknayan, Pres.....Charleston
O. M. Ferguson, Secy.....Mattoon

Cook County—Chicago Medical Society.
G. W. Webster, Pres.....Chicago
R. T. Gillmore, Secy.....Chicago

Crawford County.
F. Dunham, Pres.....Robinson
H. N. Rafferty, Secy.....Robinson

Cumberland County.
G. E. Lyon, Pres.....Robinson
Will L. Smith, Secy.....Toledo

DeKalb County.
Geo. W. Nesbit, Pres.....Sycamore
C. H. Mordoff, Secy.....Genoa.

De Witt County.
J. M. Wilcox, Pres.....Clinton
A. E. Campbell, Secy.....Clinton

Douglas County.
E. S. Allen, Pres.....Arcola
Walter C. Blaine, Secy.....Tuscola

Du Page County.
(Affiliated with Cook County.)

Edgar County.
W. S. Jones, Pres.....Redmon
W. H. Ten Broeck, Secy.....Paris

Edwards County.
W. E. Buxton, Pres.....Samsville
J. H. Lacey, Secy.....Albion

Effingham County.
T. J. Dunn, Pres.....Elliottstown
C. F. Burkhardt, Secy.....Watson

Fayette County.
H. D. Smith, Pres.....Vandalia
A. L. T. Williams, Secy.....Vandalia

Franklin County.
A. G. Orr, Pres.....Benton
W. H. Smith, Secy.....Benton

Fulton County.
T. R. Plummer, Pres.....Farmington
D. S. Ray, Secy.....Cuba

Gallatin County.
I. A. Foster, Pres.....New Haven
J. W. Bowling, Secy.....Shawneetown

Greene County.
H. W. Chapman, Pres.....Whitehall
H. A. Chapin, Secy.....Whitehall

Grundy County.
W. E. Walsh, Pres.....Morris
H. M. Ferguson, Secy.....Morris

Hamilton County.
I. I. Hall, Pres.....Broughton
G. N. Lyons, Secy.....McLeansboro

Hancock County.
S. M. Parr, Pres.....Fountain Green
Wm. Blender, Secy.....Carthage

Hardin County.
F. M. Fowler, Pres.....Elizabethtown
R. H. Willingham, Secy.....Elizabethtown

Henderson County.
I. F. Harter, Pres.....Stronghurst
Ralph Graham, Secy.....Biggsville

Henry County.
J. E. Westerlund, Pres.....Cambridge
H. W. Waterous, Secy.....Galva

Iroquois-Ford District.
D. W. Miller, Pres.....Gilman
Robt. Lumley, Secy.....Watseka

Jackson County.
O. B. Ormsby, Pres.....Murphysboro
W. C. Hill, Secy.....Murphysboro

Jasper County.
H. S. Hinman, Pres.....Newton
Jas. P. Prestley, Secy.....Newton

Jefferson County.
J. H. Mitchell, Pres.....Mt. Vernon
J. R. Whitlock, Secy.....Mt. Vernon

Jersey County.
A. K. Van Horne, Pres.....Jerseyville
H. R. Bohannan, Secy.....Jerseyville

Jo Daviess County.
E. M. Bench, Pres.....Galena
D. G. Smith, Secy.....Elizabeth

Johnson County.
H. D. Larue, Pres.....New Burnside
H. O. Williams, Secy.....Belknap

Kane-McHenry District.
J. F. Bell, Pres.....Elgin
G. S. Allen, Secy.....Aurora

Kankakee County.
B. F. Uran, Pres.....Kankakee
A. S. Kenega, Secy.....Kankakee

Kendall County.
T. B. Drew, Pres.....Oswego
R. A. McClelland, Secy.....Yorkville

Knox County.
J. H. Brown, Pres.....Rio
G. S. Bower, Secy.....Galesburg

Lake County.
E. H. Pomeroy, Pres.....Highland Park
A. C. Haven, Secy.....Lake Forest

La Salle County.
F. A. Wiley, Pres.....Carlville
W. A. Pike, Secy.....Ottawa

Lawrence County.
B. F. Hockman, Pres.....Sumner
C. P. Gore, Secy.....Lawrenceville

Lee County.
C. H. Ives, Pres.....Dixon
S. W. Lehman, Secy.....Dixon

Livingston County.
G. C. Lewis, Pres.....Fairbury
John Ross, Secy.....Pontiac

Logan County.
L. L. Leeds, Pres.....Lincoln
H. S. Oyler, Secy.....Lincoln

McDonough County.
J. B. Bacon, Secy.....Macomb

McHenry County.
(See Kane-McHenry District.)

McLean County.
Thos. W. Bath, Pres.....Bloomington
O. M. Rhodes, Secy.....Bloomington

Macon County—Decatur Medical Society.
C. Chenowith, Pres.....Decatur
M. W. Fitzpatrick, Secy.....Decatur

Macoupin County.
J. M. English, Pres.....Gillespie
E. A. Bleuler, Secy.....Carlinville

Madison County.
G. W. Hinchee, Pres.....Mors
F. C. Joesting, Secy.....Alton

Marion County.
J. E. Schoonover, Pres.....Salem
W. W. Murfin, Secy.....Patoka

Marshall County.
J. W. Potts, Pres.....Lacon
J. A. Swem, Secy.....Henry

Mason County.
H. H. Hanley, Pres.....Havana
A. L. Cook, Secy.....Mason City

Massac County.
M. H. Trovillion, Pres.....Metropolis
A. C. Ragsdale, Secy.....Metropolis

Menard County.
A. L. Britten, Pres.....Athens
Irving Newcomer, Secy.....Petersburg

Mercer County.
V. A. McClanahan, Pres.....Viola
I. E. Burtnett, Secy.....Joy

Monroe County.
John S. Sennott, Pres.....Waterloo
Elbert J. Lee, Jr., Secy.....Valmeyer

Montgomery County.
P. M. Kelly, Pres.....Litchfield
H. F. Bennett, Secy.....Litchfield

Morgan County.
Josephine Milligan, Pres.....Jacksonville
David W. Reid, Secy.....Jacksonville

Moultrie County.
W. E. Stedman, Pres.....Sullivan
F. P. Zerfass, Secy.....Sullivan

Ogle County.
J. A. Johnston, Pres.....Byron
F. W. Mitchell, Secy.....Leaf River

Peoria City Medical Society.
R. A. Kerr, Pres.....Peoria
F. K. Sidley, Secy.....Peoria

Perry County.
W. L. McCandless, Pres.....Pinckneyville
J. W. Smith, Secy.....Pinckneyville

Piatt County.
W. F. Matson, Pres.....Monticello
B. L. Barker, Secy.....White Heath

Pike County.
J. D. McKinney, Pres.....Barry
R. H. Main, Secy.....Barry

Pope County.
Jas. Dixon, Pres.....Hartsville
W. A. Sim, Secy.....Golconda

Pulaski County.
Monroe, Doty, Pres.....Grand Chain
A. W. Tarr, Secy.....Grand Chain

Putnam County.
G. A. McCormick, Pres.....Hennepin
R. G. Dakine, Secy.....Magnolia

Randolph County.
C. G. Smith, Pres.....Red Bud
A. D. Steele, Secy.....Chester

Richland County.
H. T. Watkins, Pres.....Olney
E. H. Horner, Secy.....Olney

Rock Island County.
F. H. Gardner, Pres.....Moline
Ralph Dart, Secy.....Moline

St. Clair County.
Hugo Wangelin, Pres.....Belleville
J. W. Twitchell, Secy.....Belleville

Saline County.
J. R. Baker, Secy.....Harrisburg

Sangamon County.
R. D. Barry, Pres.....Springfield
E. R. Spicer, Secy.....Springfield

Schuyler County.
A. W. Ball, Pres.....Rushville
W. F. Harvey, Secy.....Rushville

Scott County.
J. W. Weis, Pres.....Manchester
J. P. Campbell, Secy.....Winchester

Shelby County.
C. L. Smith, Secy.....Shelbyville

Stark County.
W. T. Hall, Pres.....Toulon
Arthur Parsons, Secy.....Toulon

Stephenson County.
R. J. Burns, Pres.....Freeport
R. F. Snyder, Secy.....Freeport

Tazewell County.
E. F. Kelchner, Pres.....Delavan
C. G. Muehlmann, Secy.....Pekin

Union County.
S. C. Martin, Pres.....Anna
H. J. Lyerly, Secy.....Jonesboro

Vermilion County.
T. E. Walton, Pres.....Danville
E. E. Clark, Secy.....Danville

Wabash County.
R. J. McMurray, Pres.....Linn
G. C. Kingsbury, Secy.....Mt. Carmel

Warren County.
E. C. Linn, Pres.....Monmouth
A. G. Patton, Secy.....Monmouth

Washington County.
J. J. Troutt, Pres.....Nashville
D. S. Neer, Secy.....Beaucoup

Wayne County.
W. M. Johnson, Pres.....Johnsonville
J. P. Walters, Secy.....Fairfield

Whiteside County.
F. Anthony, Pres.....Sterling
C. M. Frye, Secy.....Rock Falls

White County.
M. J. Hopkins, Pres.....Burnt Prairie
F. C. Sibley, Secy.....Carmi

Will County.
Alfred Nash, Pres.....Joliet
M. K. Bowles, Secy.....Joliet

Williamson County.
A. M. Edwards, Pres.....Marion
D. D. Hartwell, Secy.....Marion

Winnebago County.
T. H. Culhane, Pres.....Rockford.
W. E. Park, Secy.....Rockford

Woodford County.
R. E. Gordon, Pres.....El Paso
Jos. I. Knoblauch, Secy.....Metamora